DECEMBER 13, 1954

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

Aircraft Suppliers Still Flying High

—page 57

✔ **THE COMPANY CHRISTMAS PARTY**
A Family Affair for '54, p. 67

✔ **AIR FOR EXPANDED USE**
How To Figure Future Needs, p. 100

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you get

easy, quick, economical production

of your parts with

because it has in every foot the

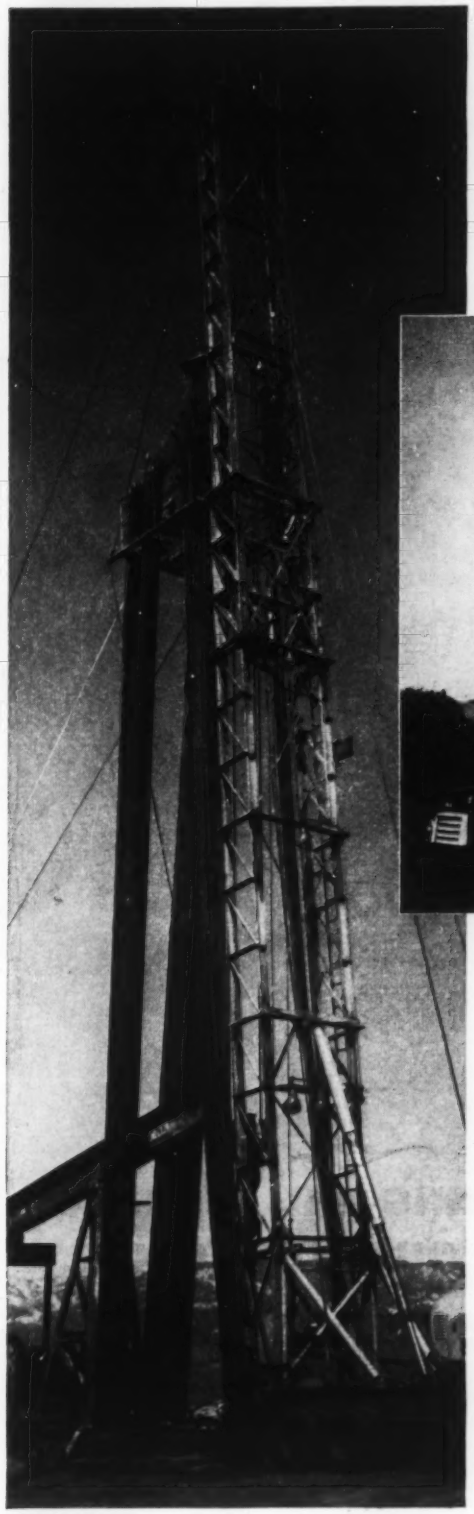
desired uniform properties

for
EFFICIENT EXPANDING, SWAGING, BENDING, MACHINING

B&W SEAMLESS and WELDED TUBES

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing

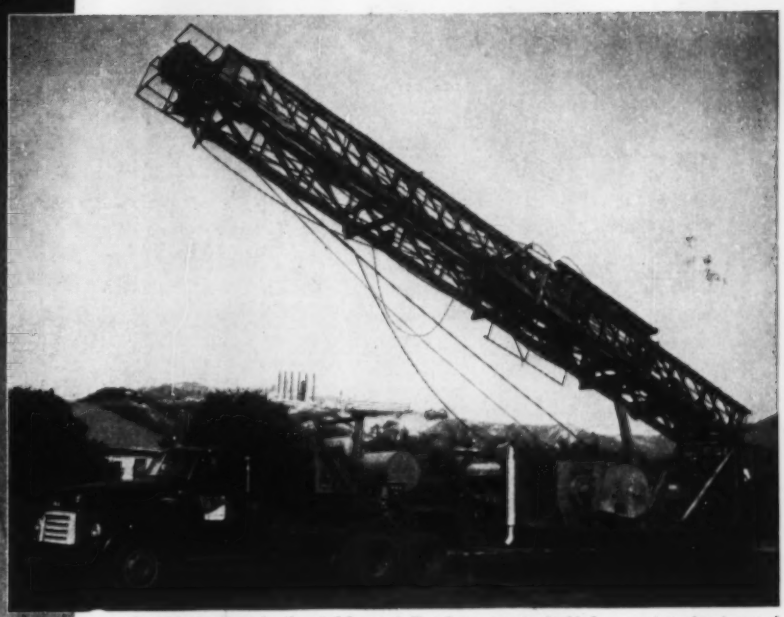
TA-4035 (CWM)



In operation, mast is 90 ft high. All-Mayari R construction gives it hook-load capacity of 210,000 lb.

Lightweight Mast

DOES A HEAVYWEIGHT JOB



On road, mast built of Mayari R telescopes in half, lowers into horizontal position on trailer much like extension ladder on fire truck.

The mast for this portable oil-well-servicing rig has to be strong. Pulling up a 10,000-foot string of tubing from an oil well is no job for a weakling, especially if the load is 100,000 lb or more. On top of that, when it breaks loose from the bottom of the hole, the tubing lets go with a rush that bounces the mast like a boy on a pogo stick.

This mast has to be light, too, because it's a portable mast. A trailer carries it from job to job over public highways subject to weight restrictions.

Striking this balance between rugged strength and light weight was a made-to-order assignment for Mayari R low-alloy, high-strength steel. With 50 pct greater strength than carbon steel, Mayari R in lighter sections provided the 100-ton load capacity desired, while paring 20 pct deadweight from the mast. One more in the almost limitless variety of applications in which "Mayari R makes it lighter . . . stronger . . . longer-lasting."

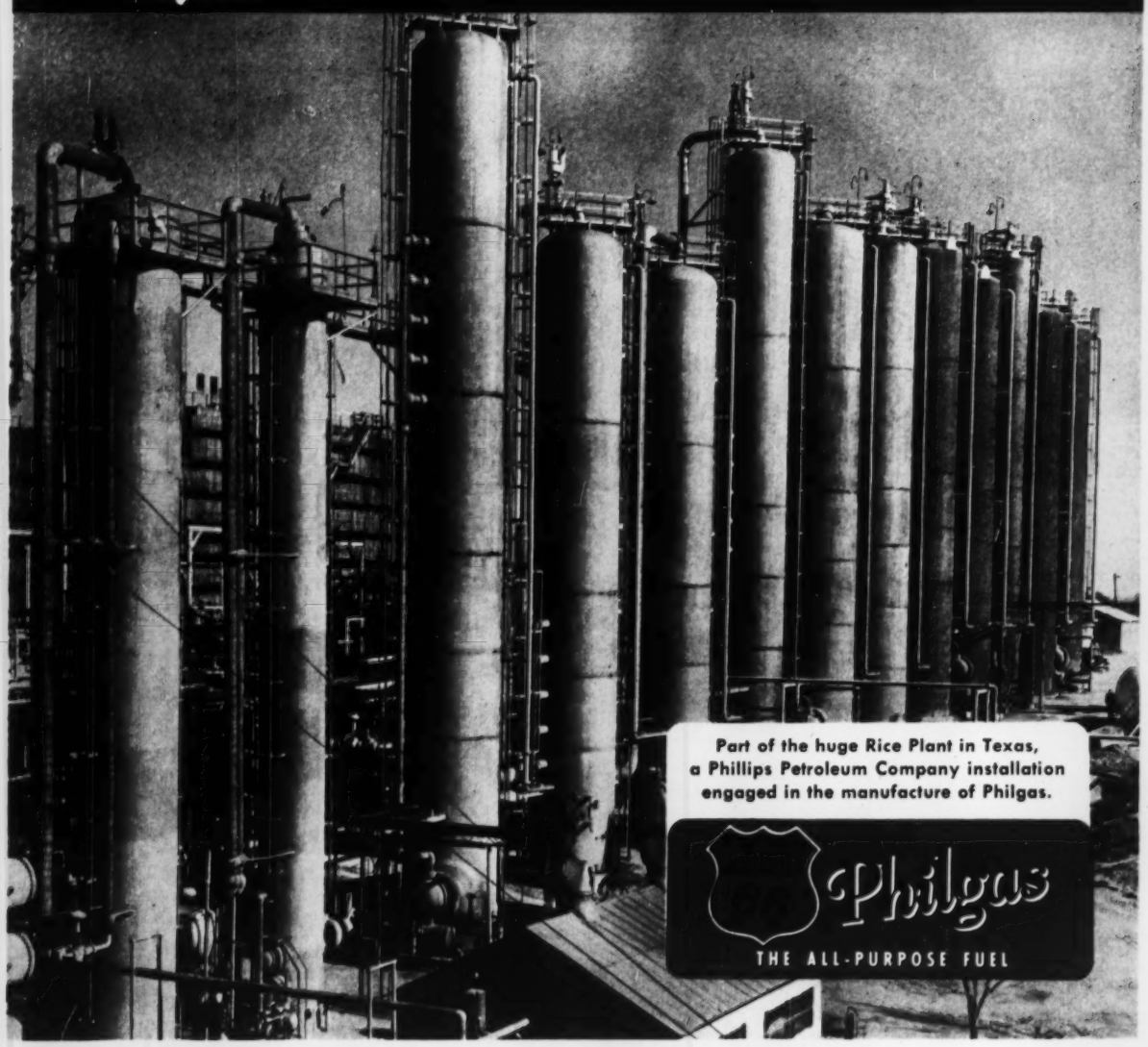
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

Mayari R *makes it lighter... stronger... longer lasting*

Philgas* IS AMERICA'S LARGEST SELLING LP-GAS



Part of the huge Rice Plant in Texas, a Phillips Petroleum Company installation engaged in the manufacture of Philgas.

PHILLIPS MODERN MANUFACTURING AND STORAGE FACILITIES ASSURE YOU A HIGH QUALITY PRODUCT.

● Phillips modern facilities and strict standards of production are your assurance of the purity, uniformity and high thermal value of Philgas. Phillips vast storage capacity helps assure you of dependable, year-around supply. Phillips also maintains its own fleet of tank cars and trucks to provide prompt deliveries.

Philgas is a clean-burning LP-Gas with uniform thermal values and gravity. It is free from harmful contaminants. With Philgas you can have automatic systems with constant, easily controlled operations. Write for information. Find out why many leading industries are using Philgas to turn out better products and, at the same time, cut operating expenses.

*Philgas is the Phillips Petroleum Company trademark for its high quality propane-butane LP-Gas or bottled gas.

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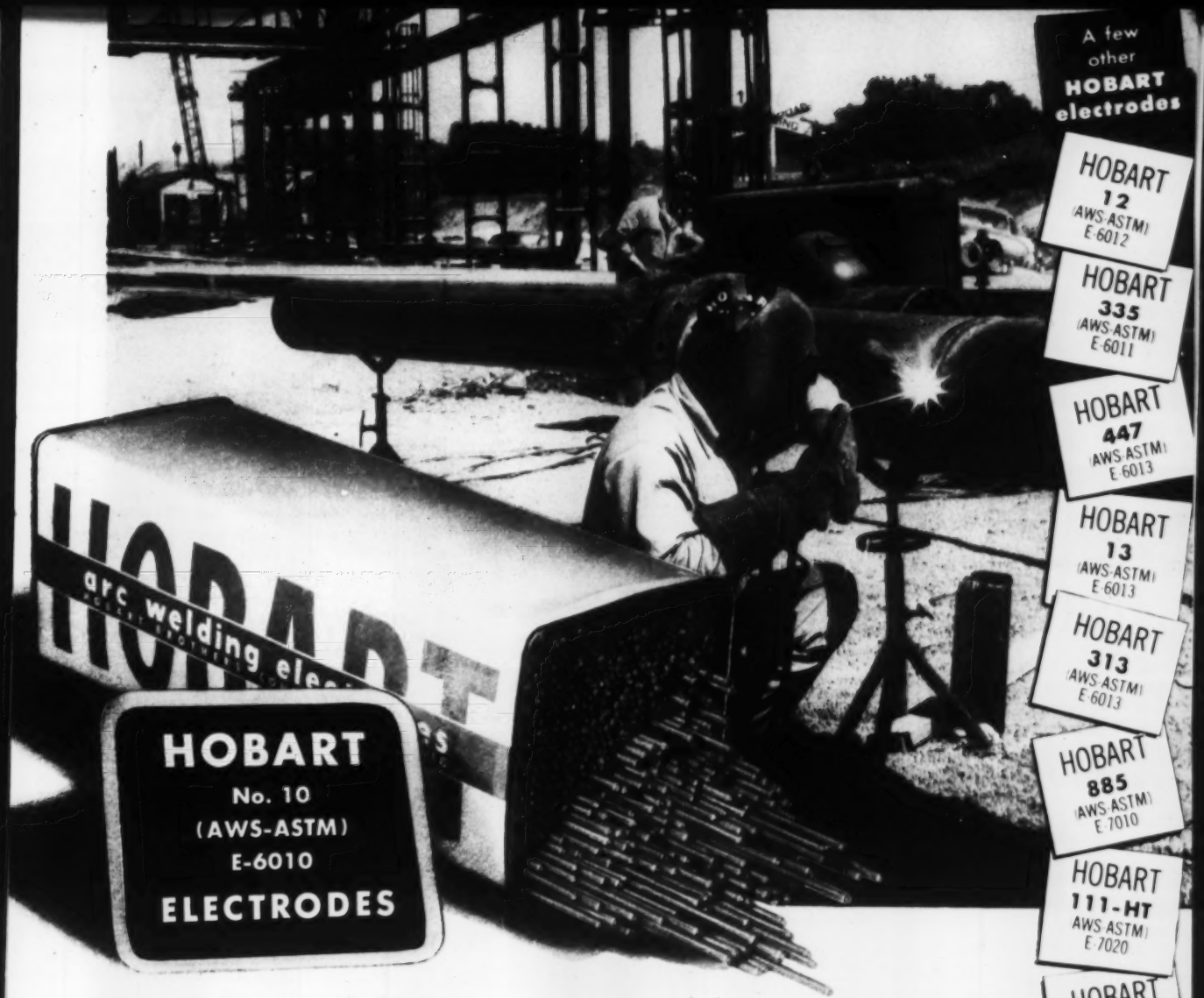
Offices located in Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Indianapolis, Ind., Kansas City, Mo., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., St. Louis, Mo., Tampa, Fla., Tulsa, Okla., Wichita, Kans.



A few other **HOBART electrodes**

- HOBART 12 (AWS-ASTM) E-6012
- HOBART 335 (AWS-ASTM) E-6011
- HOBART 447 (AWS-ASTM) E-6013
- HOBART 13 (AWS-ASTM) E-6013
- HOBART 313 (AWS-ASTM) E-6013
- HOBART 885 (AWS-ASTM) E-7010
- HOBART 111-HT (AWS-ASTM) E-7020
- HOBART ROCKET 24 (AWS-ASTM) E-6024
- HOBART 16 & 716 (AWS-ASTM) E-7016
- HOBART 816 (AWS-ASTM) E-8016

Quality Welds . . . Spray Type Arc

(Deep Penetration . . . High Ductility)

The Hobart No. 10 (E-6010) is an all-position, DC reverse polarity electrode that assures quick, easy slag removal. It gives a deeper penetrating arc and deposits a smooth, flat bead of high tensile strength and ductility.

Widely employed in the welding of high pressure mild steel piping, pipe lines, structural steel work, oil well casing, boilers, storage tanks, and ship construction. It is especially made for welding on material where tie-up stresses are involved. Other applications include unfired pressure vessels, machinery of all kinds, truck frames, bridges and piers, water towers, freight cars, wrought iron fabrications, etc. Let an actual test prove that it will give you better, faster welds at lower costs. Tell us your type of work and we'll send test samples without obligation. Write today.

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ADDRESS _____

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WITH FAST, VERSATILE PRECISION WAY MACHINES

STYLE 58 TWO-WAY: Operates from a single push-button station. Handles large, heavy work. Fixture section can be designed to accommodate the way units from any angle.

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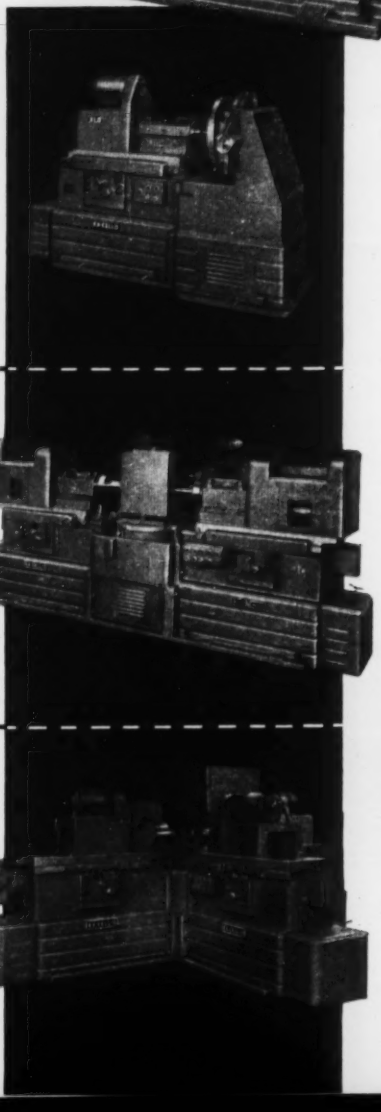
STYLE 54 ONE-WAY: A standard way unit combined with a fixture unit to suit the work. Large, heavy, and awkward parts, loaded in the fixture, remain stationary; the spindles advance to the work.



STYLE 54 THREE-WAY: Standard way units are electrically interlocked to operate simultaneously, or in any sequence. Fast and efficient for machining parts from three directions and holding accurate locations.

STYLE 58 FOUR-WAY: Controlled from a central push-button station. Particularly suitable for machining parts from four directions simultaneously, and performing progressive operations.

54-3

EX-CELL-O

WAY TYPE PRECISION BORING MACHINES ARE PROFIT INSURANCE

Way Machines perform such operations as precision boring, turning and facing. They consist of one or more standard way units combined with a fixture section. Each way unit has its own hydraulic system and controls to operate the spindle slide. Tooling and fixture are added to suit the individual operation. Get details from your Ex-Cell-O representative or write for Way Machine Catalog.

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XLO
EX-CELL-O for PRECISION

This Week in Metalworking

STEEL
THE WEEKLY MAGAZINE OF METALWORKING

Vol. 135 No. 24 December 13, 1954

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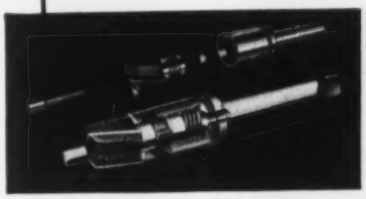
Continental

Counterbore Sets Save Your Time— Save Your Tools

A Twist of the Wrist engages or releases the cutters. Double lugs on cutter engage double abutments in holder. Double aligning bearings for rigidity.



Phantom view shows the strong, rigid drive for quick interchangeability of tools.

CONTINENTAL has three STANDARD COUNTERBORE SETS for your selection. They are toolroom favorites. WRITE FOR CATALOG and prices.

CTW

for light grinding and polishing

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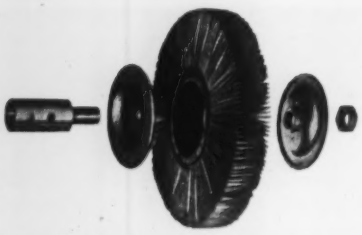
FLEXIBLE GRINDING WHEEL

This fast-cutting grinding wheel removes burrs, flash, tool marks from contoured parts without digging into the metal. Consists of hundreds of "leaves" of aluminum-oxide cloth sealed to a core. Attaches to your present power tools or any rotating spindle. No special equipment to buy. Wide range of grits. Safe and easy to use. Mount several wheels side by side for any required width. There's nothing like it.



For finishing complex contours

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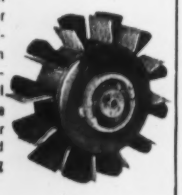
BRUSH-BACKED ABRASIVE WHEELS

Use Sand-O-Flex for lighter and more intricate contour work on metals, plastics, wood, rubber, etc. Cannot gouge, "flat" or mar surfaces. Attaches to motor shaft or power tools. Available in four sizes from portable to heavy-duty production line models. Refill abrasive cartridges range from coarse to very fine for all types of finishing and polishing. Write for catalog and prices.



MERIT PRODUCTS, INC.

4023 IRVING PLACE, CULVER CITY, CALIF.

behind the scenes

Misplaced Loyalty

Devotion to the boss sometimes can really foul up the deal. Consider the case of Thomas D. Jolly, V. P., The Aluminum Co. of America, and the loyal employees who affectionately threw a road-block in his drive toward the establishment of American standards. For many years Mr. Jolly devoted much time and effort toward standards; eventually his zeal in this connection was noted officially by the American Standards Association. Members of this body, assembled at their 36th annual meeting November 17 in New York, honored Mr. Jolly by presenting him with the Howard Coonley Award for 1954. Unable to attend, Mr. Jolly accepted the award through the assistance of Roy A. Hunt, Chairman of the Alcoa Executive Committee, who also read Mr. Jolly's prepared reply.

As you know, the giving and taking of awards can be pretty deadly. Donors, winners, chairmen and assorted speakers very often move about self-consciously, and the public speaking that echoes from the table frequently has the snap of bubbling porridge. Happily, these melancholy phenomena were missing when Mr. Hunt read Mr. Jolly's address, "The Importance of Standardization".

Nonconformists—By Plan

Back in 1941, it was revealed, half a dozen groups sponsored the standardization of manhole covers, yet as recently as two years ago everybody made manhole covers to suit himself: government departments, the several Navy yards, the Army Engineers, airports, municipalities, etc. One foundryman complained that he was obliged to carry 134 patterns for manhole covers. Mr. Jolly was deeply concerned, and he began his investigation by inquiring if the Aluminum Co. of America had adopted the American Standard. He was informed that it was adopted in every plant except the New Kensington branch.

Why was the New Kensington plant so stubborn? Well,, that's where Thomas D. Jolly started in with the Aluminum Company many years ago. Drawings of the manhole covers used there were brought to him, and they were marked, "Designed by Jolly, Drawn by Jolly, Traced by Jolly". The New Kensington boys had no intention of letting him down by using an American Standard over one designed by Jolly.

Are We Only Half Safe?

Every so often surveys tell us what parts of STEEL interest you—and what parts don't. The editors are guided by these suggestions in many instances. The Metalworking Outlook, for example, is highly regarded. In a recent issue this feature was noted by Corporation Officials (54.8%); Department Managers (81%); Engineers (69.2%); Purchasing Agents (50%) and Metal Producers (88.8%). In the same issue 42.4% of the Department Managers interviewed confessed noting this page of ours, but (gulp!) not a single Purchasing Agent gave it a tumble!

Iron Brain At U. S. Steel

When Eisenhower was riding his landslide into office a few years ago, a strange machine shared the headlines with him: it was the Univac, a weird contrivance billed as The Mechanical Brain. You simply fed it chunks of equations, percentages, assorted figures and other pertinent data, and it spat out answers to all sorts of questions. The United States Steel Corp., ever on the alert to practice new departures, last week installed its second electronic computer, or Univac, at its Gary (Ind.) Steel Works. The first installation was made in the Pittsburgh office of the National Tube Division in August. The U. S. Steel people may develop some interesting results when they feed their mechanical brain sheets-of-comparisons, data of operations, coke rates per ton and related items, but what will happen if a spy gets in there and fools around? You don't have to beat this machine to make it talk: you don't have to bribe it, or blackmail it, either. Just throw in the questions, wait out the digestive period, and step out fully informed.

Shrdlu

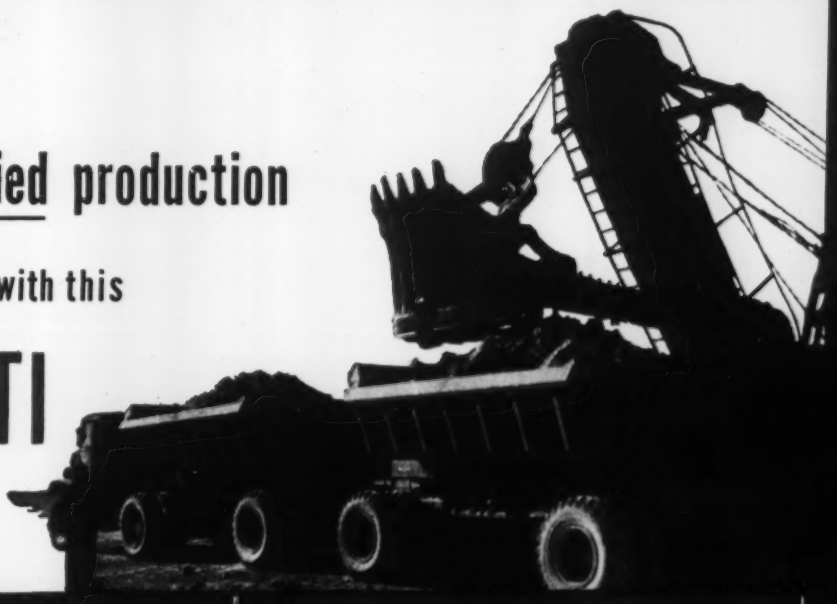
(Metalworking Outlook—Page 49)

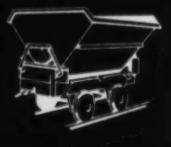
EASTON simplified production

and improved product with this

CINCINNATI

Press Brake





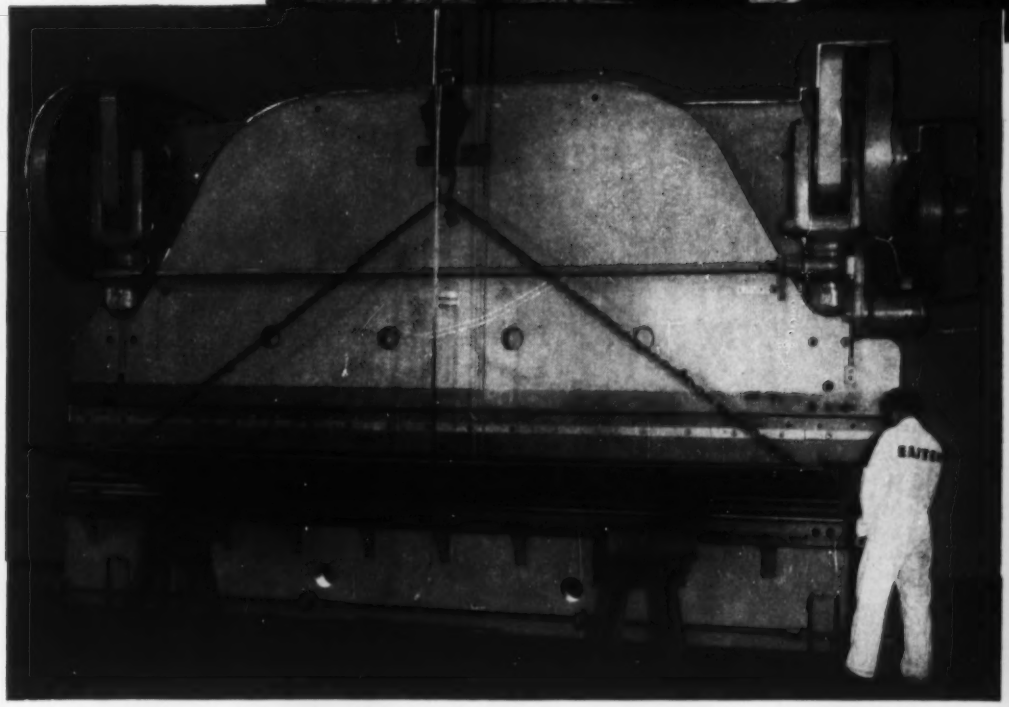


Illustration courtesy Easton Car & Construction Company, Easton, Pennsylvania.

Here a Cincinnati Press Brake is forming ½" plate for wide sections of off-highway trailers, at the Easton Car & Construction Company, makers of a large line of products for industrial transportation.

By using this Cincinnati Press Brake, some welding operations were eliminated, which improved the product, and reduced production costs at the same time.

The power, accuracy, and versatility of Cincinnati Press Brakes are reducing manufacturing costs where ever they are installed. If you form, or bend, you should investigate their possibilities.

Write for Press Brake Catalog B-4.

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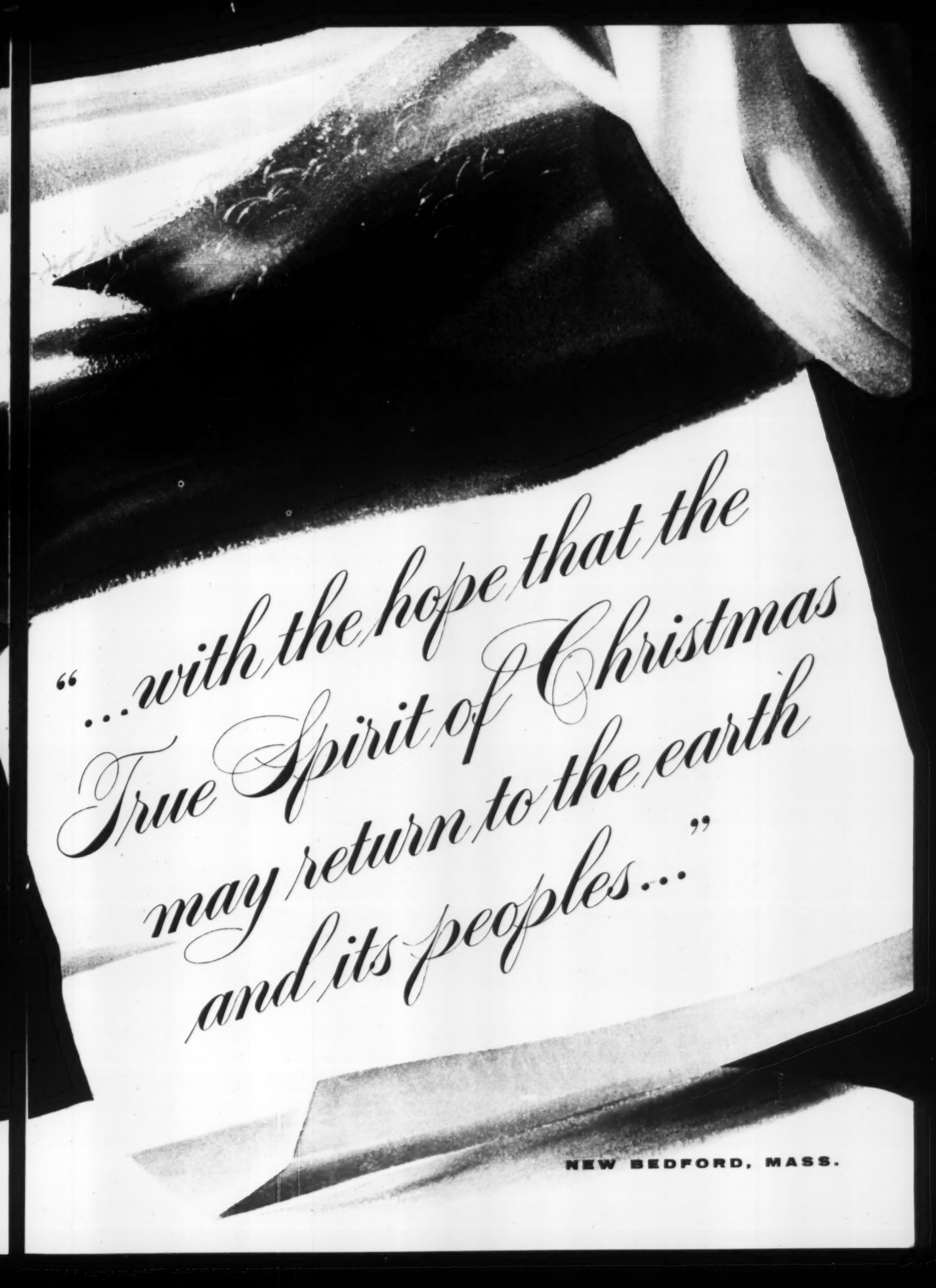
"...with the hope that the
True Spirit of Christmas
may return to the earth
and its peoples..."
NEW BEDFORD, MASS.

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HINDE & DAUCH

Authority on Packaging

LETTERS
TO THE EDITORS

Time Makes Wealth

You can feel good about your editorial entitled "What Is Wealth?" (Nov. 29, p. 31). It is particularly appropriate today and is a subject on which we in the institute are most cognizant. (Wealth is more than money in the bank . . . it's time turned into things . . .).

L. West Shea
Material Handling Institute Inc.
Pittsburgh

You have done a fine piece of work in carrying the torch . . . "What Is Wealth?" ought to be passed along to Sinclair Weeks.

Horace Treharne
Cleveland Advertising Club
Cleveland

Your editorial, "What Is Wealth?", is one which I find well worth reading. If available, I would appreciate receiving 25 tear sheets.

R. C. Riedinger
Chesapeake & Ohio Railroad Co.
Cleveland

Making Leaded Steels

Please forward five copies of your informative article entitled, "Adding Lead to Steel . . . Here's How It's Done" by Machine Tool Editor, Robert F. Huber, in the Oct. 25 issue, p. 150.

Paul Stringfield
Tulsa Winch Division
Vickers Inc.
Tulsa, Okla.

Please forward five copies to the office of the commanding general . . .

Walker Evatt
assistant
Ordnance Tank-Automotive Command
Detroit

Please send me six tear sheets . . .

E. C. Rudolphy, Petrographer
Research Laboratory
South Works
U. S. Steel Corp.
Chicago

I would appreciate 50 copies . . .

William E. Geidt
Inland Steel Co.
Chicago

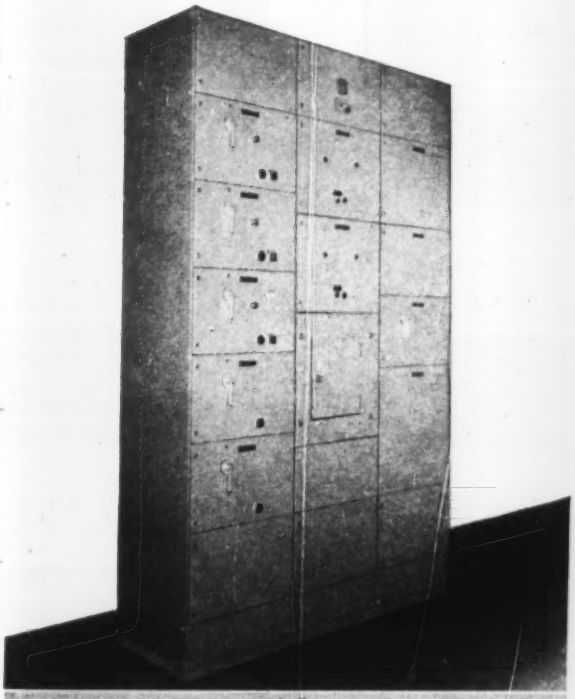
Will you kindly send us 24 copies . . .

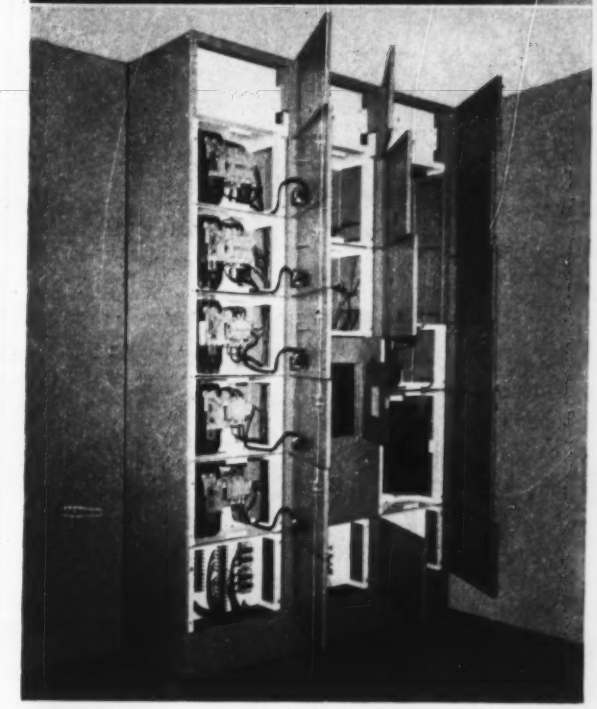
James A. Parsons
vice president
Ward Steel Co.
Cambridge, Mass.

Please send 20 copies . . .

John Finn
Drake Steel Supply Co.
Los Angeles

(Please turn to page 12)





The Problem:

RUNNING A BIG PLANT WITH LIMITED PERSONNEL

A CITY FINDS The Answer:

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The City of Meriden, Connecticut was faced with the problem of running its new sewage disposal plant efficiently with limited personnel. An Arrow-Hart Control Center . . . laid out by John P. Legnos, Associates, consulting engineers on the job . . . helped to provide the answer. Magnetic controls for the sewerage and water seal pumps, recording meters that indicate the time the pumps have run, and controls for the unit heaters in the building are all combined in a single, compact A-H Control Center. Both operation and maintenance are handled easily and effectively.

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- **IMPROVED PERFORMANCE, DEPENDABILITY** . . . are assured by exclusive Arrow-Hart "Right Angle" Starter Design.
- **EASIER MAINTENANCE** . . . all controls are grouped in a single location. Each Control Unit offers Straight-Thru Wiring with all parts easily accessible from the front.

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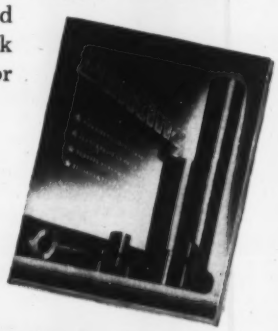

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Branches in Principal Cities • Distributors Everywhere

LETTERS

(Concluded from page 10)

Thermocouple for Tough Jobs

In the Nov. 1 "Technical Outlook," p. 81, there is a reference to a rugged thermocouple which has worked satisfactorily up to 60,000 psi under severe mechanical vibration. Where can we get more information on it?

E. E. Macfarlane
chief chemist
Air Brake Division
Westinghouse Air Brake Co.
Wilmerding, Pa.

• *Write to F. M. Stevens, manager, Engineering Department, Midwest Research Institute, 4049 Pennsylvania, Kansas City, Mo.—ED.*

Dry Lubrication

An article in your "Technical Outlook" for Aug. 30, p. 63, was recently brought to my attention. It was entitled, "Lubrication by Tumbling" and described a method of bonding dry molybdenum disulfide on bearing surfaces. I would be interested in seeing a copy of that article and in getting more information on the process . . .

L. Van Phelan
general manager
Electrofilm Inc.
N. Hollywood, Calif.

• *A tear sheet of the "Technical Outlook" of Aug. 30 has been sent. For further information write the Alpha Corp., Greenwich, Conn.—ED.*

We would appreciate any additional information you may be able to supply us on "Lubrication by Tumbling."

T. C. Kulesa
Lockrey Co.
Southampton, N. Y.

Design for More Profits

Your article, "Profit Is the Real Yardstick of Design," No. 10 in STEEL's 1954 Program for Management (Nov. 22, p. 81), was a nice and thorough job. Your interest in the industrial design profession, as manifest in this article, is a real contribution.

A. N. BecVar, manager
Appearance Design
Major Appliance Division
General Electric Co.
Louisville, Ky.

Your latest literary effort ("Profit Is the Real Yardstick of Design") is excellent, congratulations!

In fact, it is so good what is the possibility of my obtaining from 50 to 100 sets of tear sheets?

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• *Quotations will be sent.—ED.*

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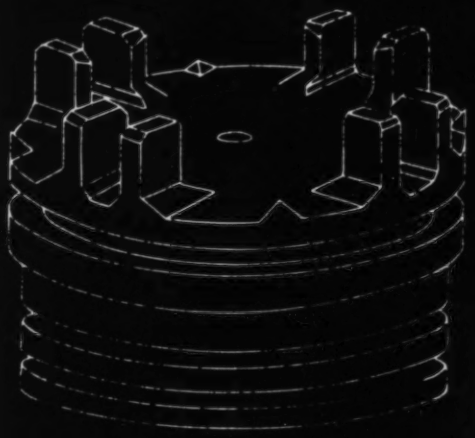
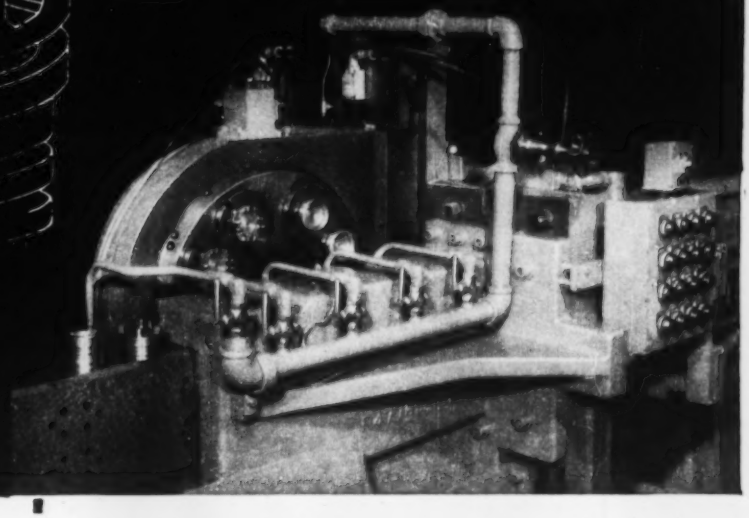


NOZZLE PART

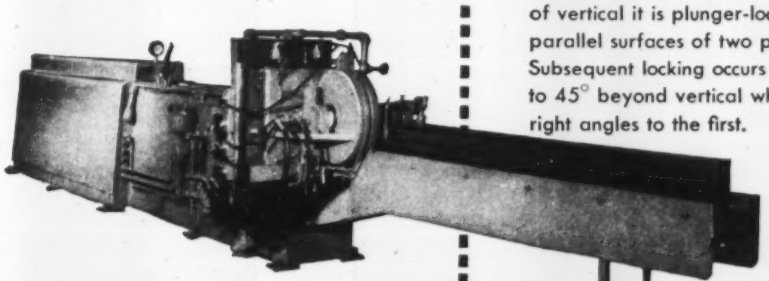
425



HP 40 HORIZONTAL 90" STROKE

Hydraulic

BROACHING MACHINE



automatic operations!

Clamping and unclamping of parts, advance into broaching position, retraction for the return, and rotation into successive locked positions are all automatic . . . with full electrical interlock . . . so the operator's chief duty is to unload and reload parts!

The efficient LAPOINTE-built fixture has a rotor mounted on a horizontal axis with 4 pairs of part nests spaced 90° apart. Parts are loaded in pairs. As the rotor turns into position 45° ahead of vertical it is plunger-locked for the initial cut, broaching the parallel surfaces of two pairs of trunnions in a single pass. Subsequent locking occurs when the rotor has automatically indexed to 45° beyond vertical where the second broaching cut is made at right angles to the first.

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Call the Ansul Man!

Get in touch with your local Ansul man through the "yellow pages" or write ANSUL CHEMICAL COMPANY, Fire Equipment Division, Department F-134, Marinette, Wisconsin.

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THE AIM of automation is to obtain maximum production within the specified tolerances at the lowest cost. This aim is nothing new. It is the primary consideration in the planning and processing of every manufacturer.

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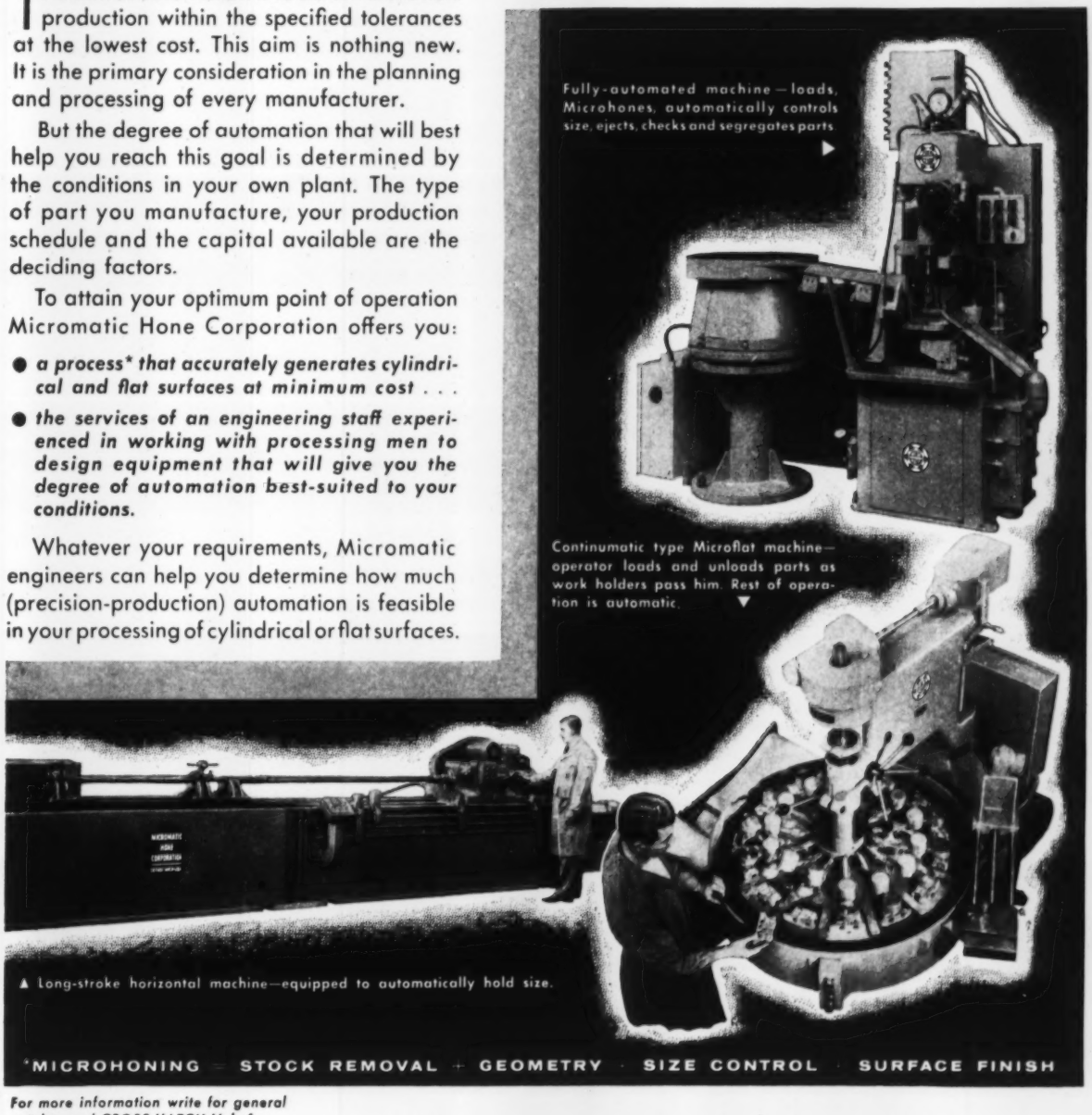
To attain your optimum point of operation Micromatic Hone Corporation offers you:

- ***a process* that accurately generates cylindrical and flat surfaces at minimum cost . . .***
- ***the services of an engineering staff experienced in working with processing men to design equipment that will give you the degree of automation best-suited to your conditions.***

Whatever your requirements, Micromatic engineers can help you determine how much (precision-production) automation is feasible in your processing of cylindrical or flat surfaces.



Fully-automated machine—loads, Microhones, automatically controls size, ejects, checks and segregates parts. ▶

Continumatic type Microflat machine—operator loads and unloads parts as work holders pass him. Rest of operation is automatic. ▼

▲ Long-stroke horizontal machine—equipped to automatically hold size.

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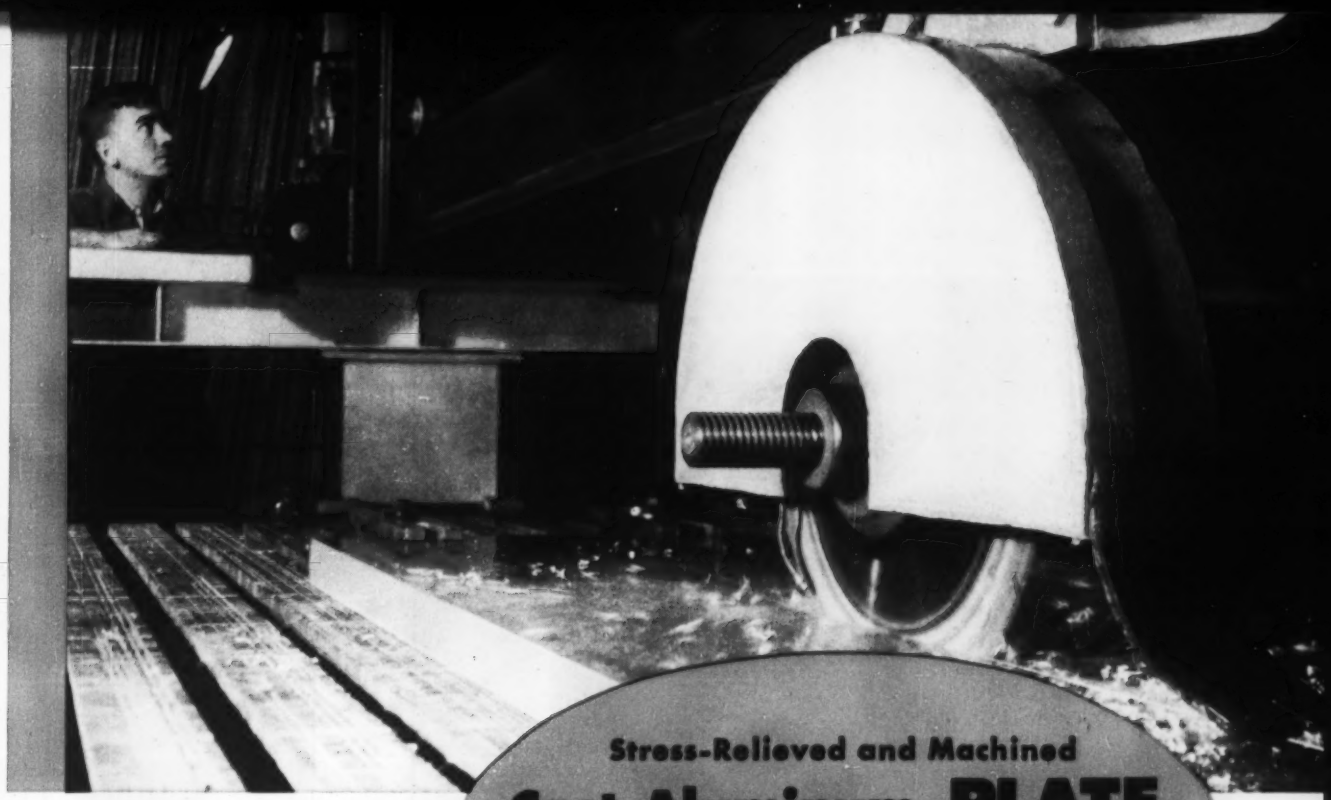

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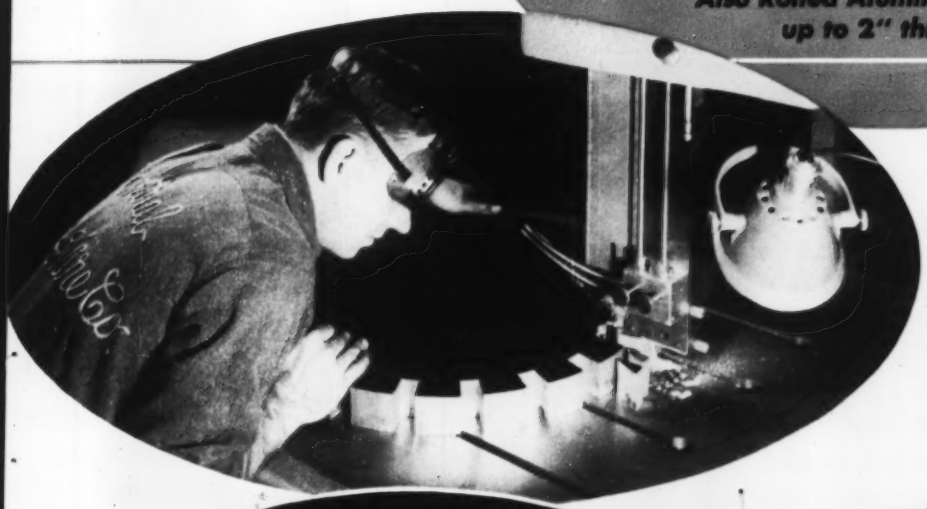

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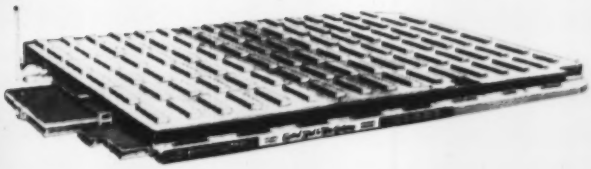

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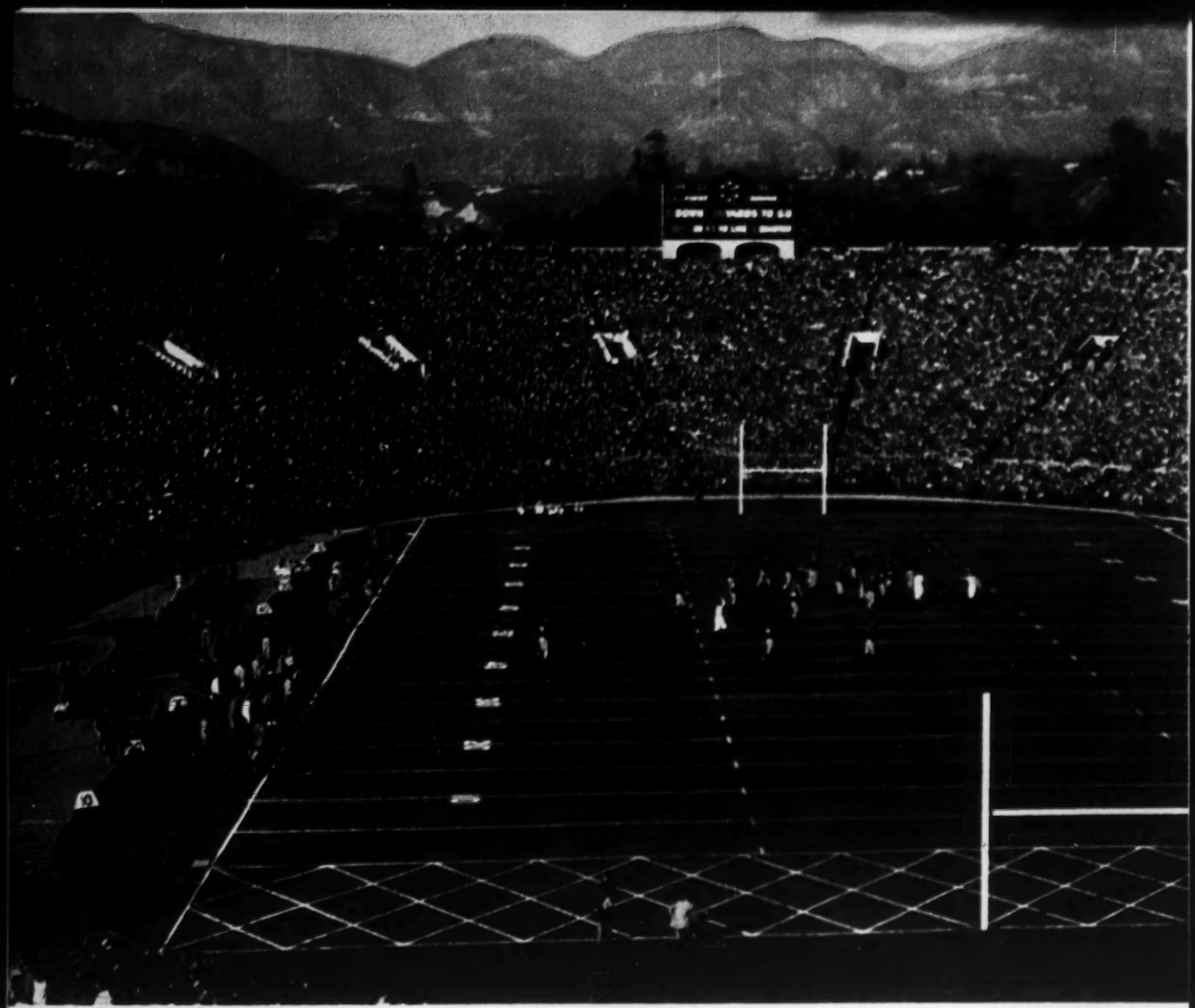

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Also 16–23"

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> "The close tolerances we obtain on our Mult-Au-Matics, regardless of age, will even surprise Bullard. Some of the diameter tolerances are as close as —.001" +.000". We have 100% inspection of every finished piece as well as of the assembled unit. We make absolutely sure that these tolerances are maintained.
>
> "Bullard Mult-Au-Matics give us the accuracy we need. I doubt whether any other machine can excel Bullard for continuity of performance — a "must" with rising material and other overhead costs."

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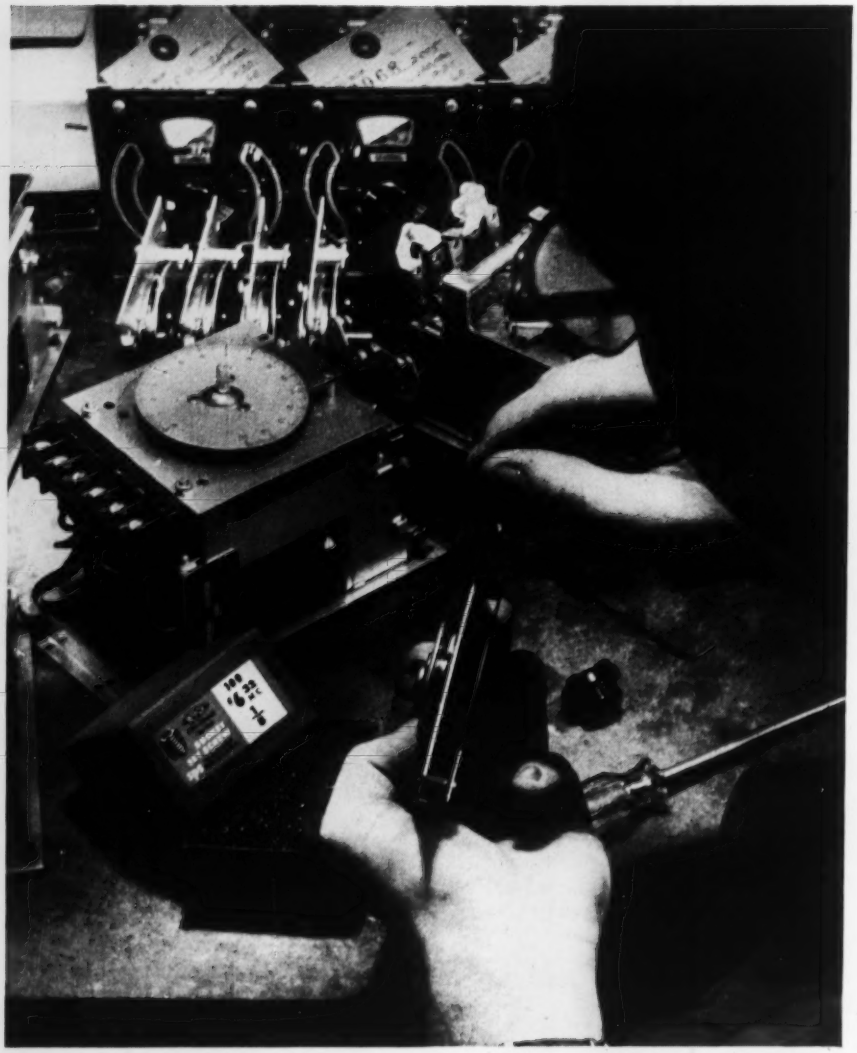
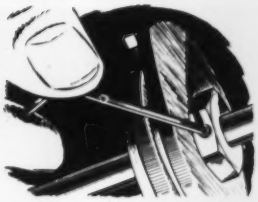


UNBRAKO Self-Locking Socket Set Screws are used to hold the Vernier-Set or Cycle-Progress cam on the shaft of this precision timing device. Once they are tightened, they maintain the accurate setting so important to the operation of the instrument.

Because they are so tiny, the UNBRAKO set screws are picked up and started in the tapped hole with the long arm key.



The compactness of the design of the timing device makes it necessary to turn the screw in prior to assembly. The uniform depth and size of the hex socket permit maximum torquing, speed assembly.

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You'll have less money tied up in inventory, you'll get personalized service, faster deliveries. In addition, you'll reduce assembly time and increase production with these precision industrial threaded fasteners. Write for UNBRAKO Standards—a complete listing of socket screw products made by SPS and stocked by your local distributor. STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

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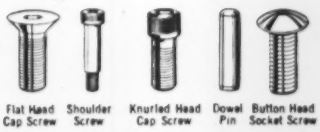
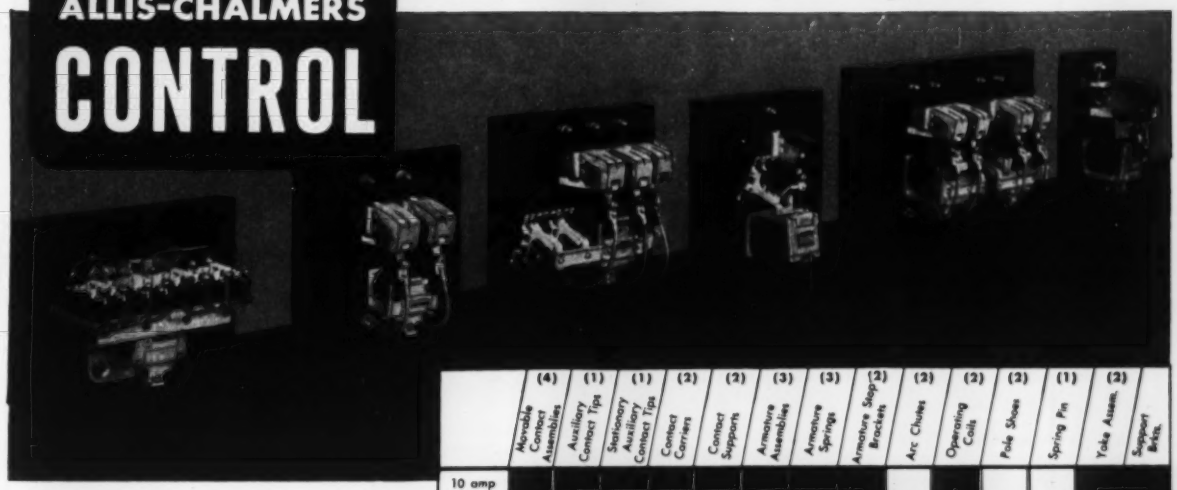


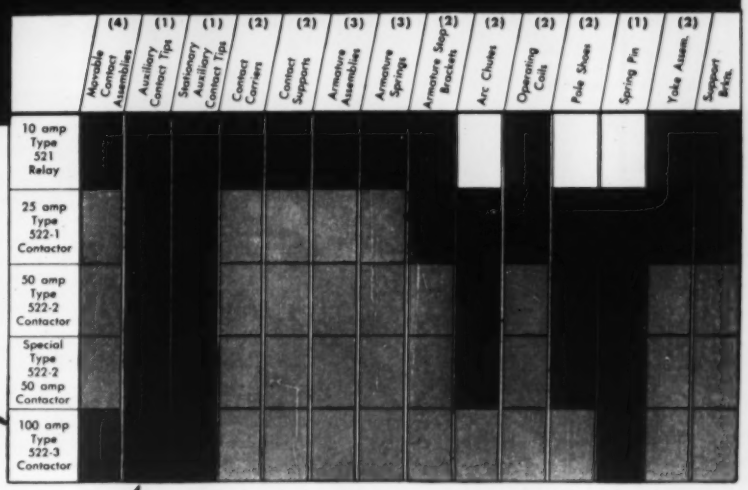
For 10 to 100 AMP applications

Check this New dc Control Line

ALLIS-CHALMERS

CONTROL





Change in color bar indicates size change. Number in parentheses tells how many sizes of that component are needed.

• This new line of general purpose, heavy-duty dc control starts with a multi-pole auxiliary relay and includes contactors ranging from 25 to 100 amps. The contactors are available in five basic units with optional arrangements of normally open and normally closed main and auxiliary contacts.

Outstanding Interchangeability of Parts Affords Maximum Convenience and Economy

This chart graphically illustrates the exceptional interchangeability of parts in this new control line. Maintenance is greatly simplified. Only a small inventory of parts is needed to keep these controls operative. The possibility of lengthy, costly "down" periods is practically eliminated.

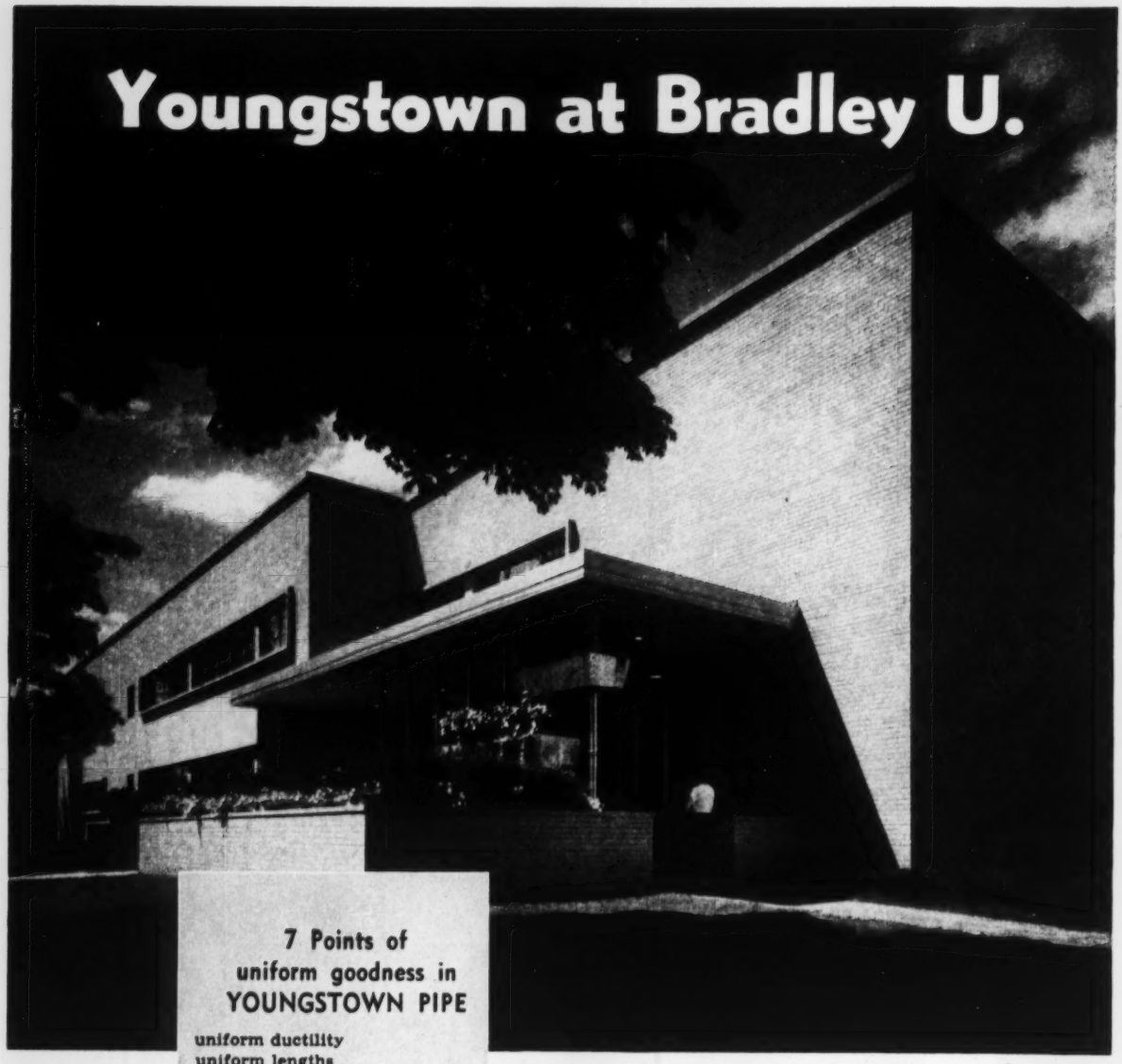
Other Features — Vertical action contactors have a rolling, self-wiping action. Contactor tips are forged copper. Current-carrying parts are silver plated. All other metallic parts are zinc plated. Relay tips are silver alloy.

A-4448

New Bulletin — Bulletin 14B8171 gives data on the Allis-Chalmers dc line which now covers the *complete range up to 600 amperes*. See your local Allis-Chalmers representative or write Allis-Chalmers, Milwaukee 1, Wis.

ALLIS-CHALMERS

Youngstown at Bradley U.



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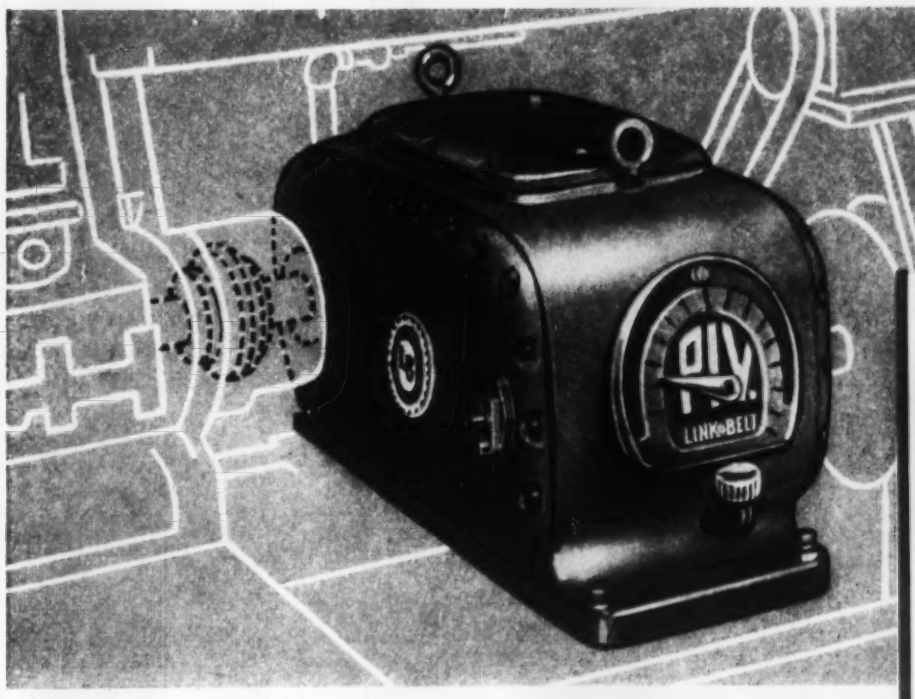
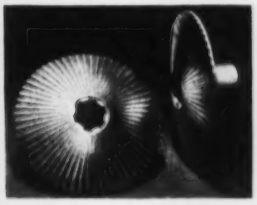
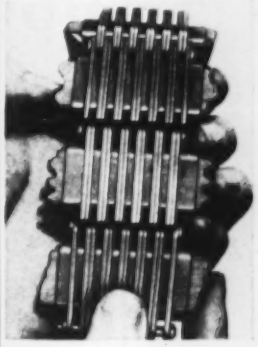


Here's the inside story



NO SLIPPAGE — HERE'S WHY! Teeth of the radially grooved wheels (above) are cut at a constant depth but are of increasing width toward the wheel periphery. The sides are beveled to provide gripping areas for the self-tooth-forming chain (below). The chain slats shuffle back and forth between the wheels—mesh fully when they engage.



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Find out how P.I.V. can extend the useful range of your machine operations. Your Link-Belt office or distributor will give you all the facts. Call today, or write for Book 2274.

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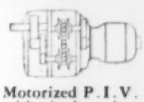
P.I.V. with single reduction input or output helical gears.

Motorized P.I.V. with single reduction input and output helical gears.



Motorized P.I.V. with single reduction input and double reduction output helical gears.

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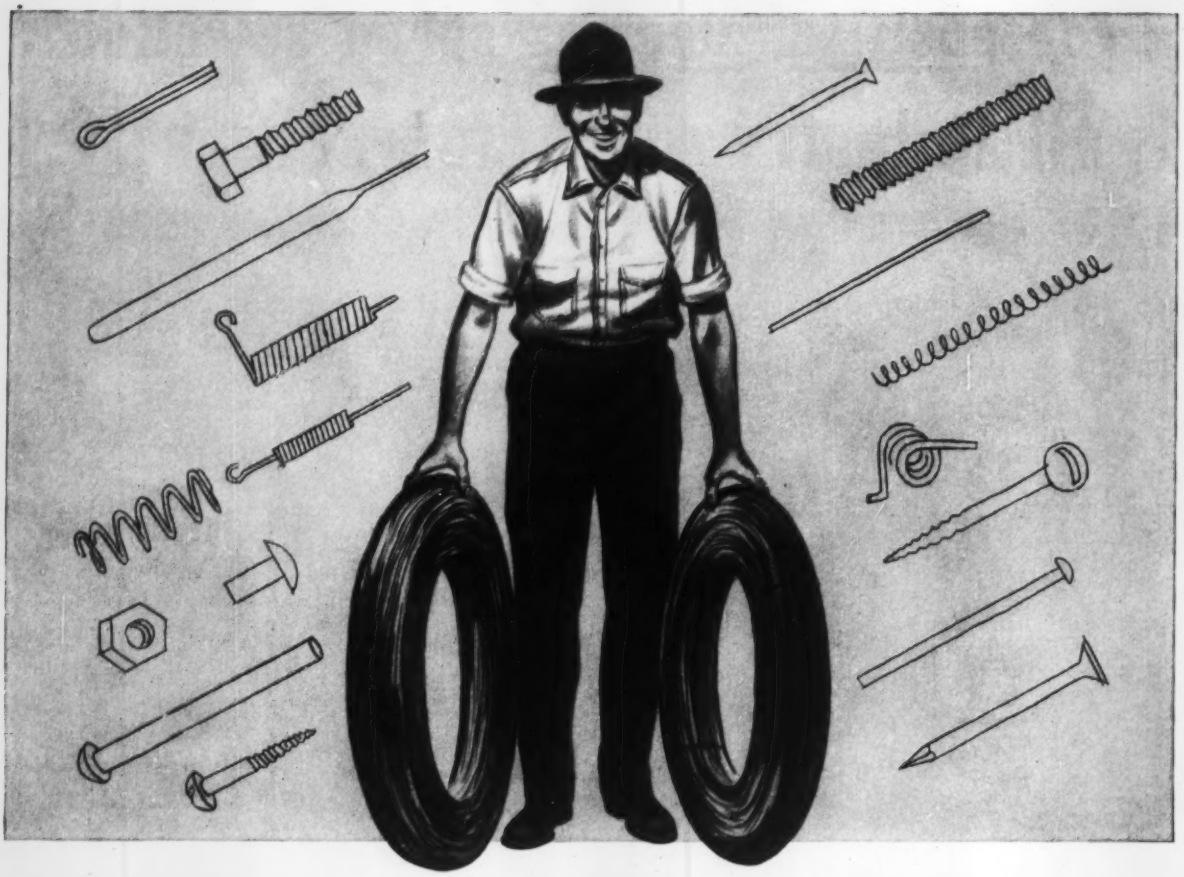

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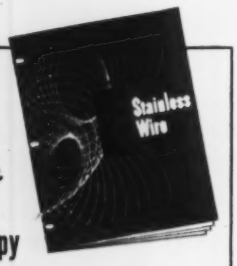

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Address Dept. S-601

COLD HEADING WIRE . . . Ready for immediate shipment: Allegheny Metal cold heading wire to meet your production requirements, in a wide range of sizes from 5/8" dia. down to 0.050".

SPRING WIRE . . . Also immediately available to your order, a wide selection of sizes of Allegheny Metal spring wire is carried in stock at convenient locations. Sizes ranging down to .004" dia. are ready for prompt shipment.

● Let us supply your immediate needs for these stainless wire products. The A-L Branch Office nearest to you will welcome your inquiries. *Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.*

Make it BETTER-and LONGER LASTING with Allegheny Metal

AL
TIME-TESTED STAINLESS STEEL

W&D-5210

Track Roller Collar
Malleable Casting
Machine Time: 44 Seconds—
81 pieces per hour.

17 operations in 44 seconds

...that's 81 pieces per hour, or 4 TIMES FASTER than by the former method...

on an ACME-GRIDLEY 8-spindle 8" chucker

Speaking of "plant automation"—how better can the modern practice of it begin than on machining methods that complete ALL the operations on intricate parts in a single predetermined cycle, in a cycle time that avoids toting the job from one machine to the next, eliminates costly manhours, investment in secondary operation machines, releases valuable floor space?

On the job shown, or any other which is "automized" through multiple spindle planning, ingenious and sound tooling of the machine to include ALL the operations in the least time becomes a matter of vital importance.

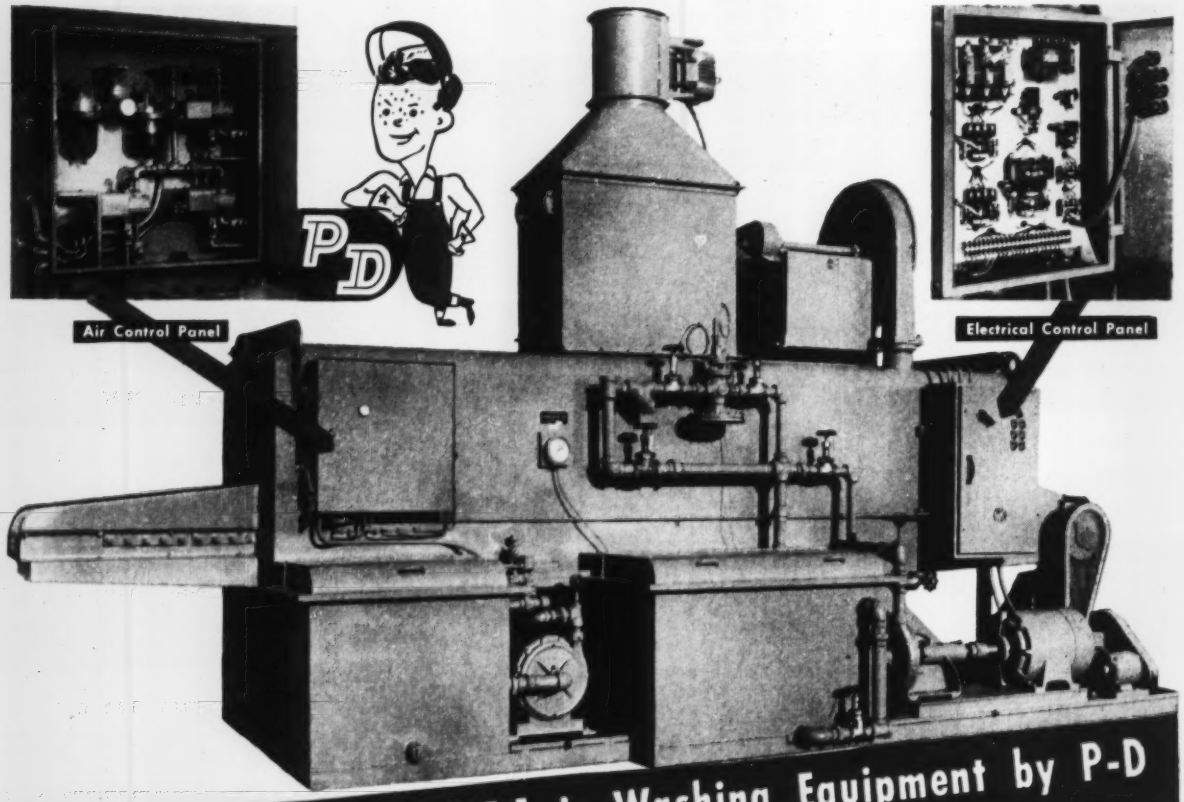
This is where the unparalleled experience of our tool Engineers wins and holds preference for Acme-Gridley bar and chucking automatics—in hundreds of shops.

Whether your chucking work calls for 4, 6 or 8 spindles, whether 4 or 20 different operations, it will pay you to look at our proposal.

REMEMBER: *No industry can do* **TODAY'S** *job—with* **YESTERDAY'S** *tools—and make a profit* **TOMORROW.**

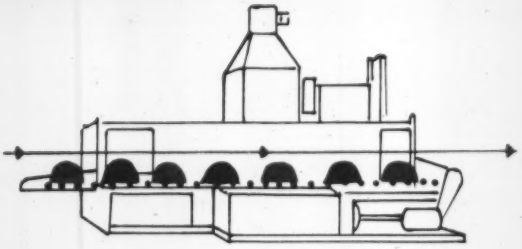
The NATIONAL ACME COMPANY

170 EAST 131st STREET • CLEVELAND 8, OHIO



AUTOMATION in Washing Equipment by P-D

Many important production problems are met and solved by this Power Spray Washer—designed, engineered, and built by Peters-Dalton. It meets the full meaning of the newly coined word "automation" by eliminating many processes that were formerly manual or handled through separate facilities.



Extremely efficient, time-saving, and economical in operation is the action of this 3-Stage Washer. It sprays both the inside and outside of converter housings. The operation is done in a continuous action—first, the housings are fed to the machine on gravity rolls—then an air cylinder moves each over the inside spray manifold. This same motion holds back the unit following and moves the preceding unit onto a cross-rod conveyor for outside wash. Another cylinder positions each unit over the manifold and blocks the shaft opening. The inside and outside wash are both heated emulsified oil cleaners—room air blow-off removes excess oil. The exhaust has an eliminator and a filter box for entrapping overspray.

Whatever your problems are for washing products during your manufacturing process, count on Peters-Dalton for the correct solution. Peters-Dalton is an organization of specialists—staffed by men who KNOW the answers. Washers of all sizes, types and required uses can be developed to meet your needs — whether from a single unit or to a complete installation — depend on P-D to give the services and production you have the right to expect. We invite inquiries—Just Write, Wire or Phone.

Ask for our new Power Spray Washer Tech. Bulletin No. 301.

P-D

- *Hydro-Whirl Paint Spray Booths*
- *Industrial Washing Equipment*
- *Drying and Baking Ovens*
- *Hydro-Whirl Dust Collecting Systems*

CALENDAR
OF MEETINGS

December 13-14, Material Handling Institute Inc.: Annual meeting, Statler hotel, New York. Institute address: 813 Clark Bldg., Pittsburgh 22. Managing director: R. Kennedy Hanson.

December 14-15, Industrial Truck Association: Annual meeting, Hotel Statler, New York. Association address: 526 Washington Loan & Trust Bldg., Washington 4. Secretary: William Van C. Brandt.

January 5-7, Institute of Scrap Iron & Steel Inc.: Annual convention, Saxony, San Souci, Sea Isle hotels, Miami Beach, Fla. Institute address: 1729 H St. N.W., Washington 6. Executive vice president: Edwin C. Barringer.

January 10-13, American Road Builders' Association: Annual meeting and exhibit, Roosevelt hotel, New Orleans. Association address: World Center Bldg., Washington 6. Executive vice president: Eugene Reybold.

January 10-14, Society of Automotive Engineers Inc.: Golden anniversary annual meeting, Sheraton-Cadillac and Statler hotels, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

January 12, Aluminum Extruders Council: Winter meeting, Saxony hotel, Miami, Fla. Council address: 209 Washington St., Boston. Secretary: Phillip Lemelman.

January 12-14, Southern Industrial Distributors Association: Midyear meeting, Edgewater Gulf hotel, Biloxi, Miss. Association address: 208 Peachtree Arcade, Atlanta 3. Secretary: Ted Pugh.

January 13, National Constructors Association: Annual meeting, Hotel Plaza, New York. Association address: 50 E. 41st St., New York 17. Secretary: C. B. Bronson.

January 14-15, Machinery & Allied Products Institute: Economic conference, Mayflower hotel, Washington. Institute address: 1200 18th St. N.W., Washington 6. Secretary: Charles W. Stewart.

January 18-20, Caster & Floor Truck Manufacturers Association: Annual meeting, New Weston hotel, New York. Association address: 27 E. Monroe St., Chicago 3. Executive secretary: Harry P. Dolan.

January 18-20, National Industrial Conference Board Inc.: General session for all associates, Hotel Astor, New York. Board address: 247 Park Ave., New York 17. Secretary: Herbert S. Briggs.

January 19-20, Steel Shipping Container Institute Inc.: Winter meeting, Hampshire House, New York. Institute address: 600 Fifth Ave., New York 20. Secretary: L. B. Miller.

January 20, Cutting Tool Manufacturers Association: Annual meeting, Oakland Hills Country Club, Detroit. Association address: 416 Penobscot Bldg., Detroit. Secretary: Martin J. Ewald.

January 20-21, Radio-Electronics-Television Manufacturers Association: Symposium on printed circuits, University of Pennsylvania, Philadelphia. Association address: 777 14th St. N.W., Washington 5. Secretary: James D. Secrest.

January 20-21, Steel Plate Fabricators Association: Annual meeting, Palmer House, Chicago. Association address: 79 W. Monroe St., Chicago. Executive director: J. Dwight Evans.

January 21, Engineers Joint Council: General assembly, Hotel Statler, New York. Council address: 29 W. 39th St., New York 18. Secretary: Stewart E. Reimel.

January 21, Malleable Founders' Society: Semiannual meeting, Hotel Cleveland, Cleveland. Society address: 1800 Union Commerce Bldg., Cleveland 14. Managing director: Lowell D. Ryan.

January 23-27, Associated Equipment Distributors: Annual meeting, Conrad Hilton hotel, Chicago. Association address: 30 E. Cedar St., Chicago. Secretary: P. D. Hermann.

January 24-25, Industrial Heating Equipment Association Inc.: Annual meeting, Sheraton-Cadillac, Detroit. Association address: 412 Fifth St. N.W., Washington. Secretary: T. F. Sheckels.

HERC-ALLOY

SLING CHAINS

● Herc-Alloy is the only exact-size alloy chain on the market. This uniformity gives you a lighter and easier-to-handle chain without any sacrifice in working load limit.

● Herc-Alloy, the original alloy steel chain, is available in running lengths as well as in all types and sizes of slings made to customer specifications.

● Write for Bulletin 100 covering Herc-Alloy Sling Chains, including helpful information on their care, use and inspection.

● CM also produces a complete line of chain attachments and welded chain of all types including stainless steel and bronze.

CM HOISTS AND CHAIN

COLUMBUS McKINNON CHAIN CORP.

Tonawanda, New York

Regional Offices: NEW YORK • CHICAGO • CLEVELAND

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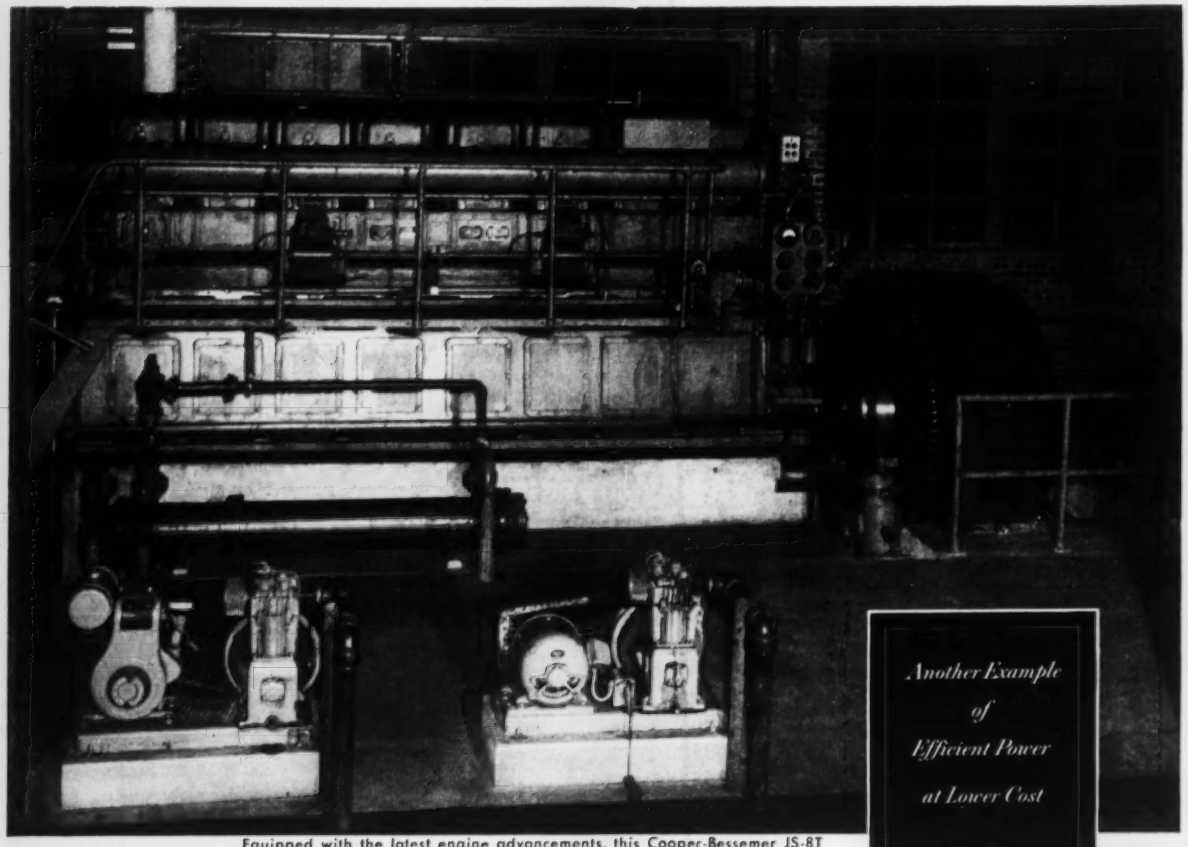
Herc-Alloy®



Equipped with the latest engine advancements, this Cooper-Bessemer JS-8T at Breese, Illinois Light and Power, easily develops 1435 bhp at 450 rpm.

How "Packaged Power" *Pays Breese a BIG Bonus*

THE Cooper-Bessemer stationary generating engine in the Breese, Illinois Municipal Light and Power plant combines several unusual features that really pay off in greatly increased horsepower and unusually high thermal efficiency. To be exact, this 8-cylinder 13" x 16" supercharged JS engine develops 1435 bhp at 450 rpm — a rating out of the question only a few years ago, but now proved conservative.

To produce such horsepower, Cooper-Bessemer added, in addition to supercharging, pre- and after-coolers employing a Vapor Phase Cooling system. Moreover, for still further economy, steam from the engine's cooling water jackets is used to heat boiler feed water for previously installed steam turbines.

And here's a mighty important point . . . in spite of its horsepower, this Cooper-Bessemer unit continues to operate *quietly, smoothly, and with no noticeable surrounding heat.* Proved by performance, this modern JS has now taken over the full load at the Breese Plant . . . and with unprecedented economy.

If your plans call for complex generating and process service, or the most simple arrangement, you'll be money and performance ahead with Cooper-Bessemer. Ask our nearest representative for specific performance figures and estimated savings based on your particular power demands.

MOUNT VERNON, OHIO
COOPER-BESSEMER
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New York, N. Y. • Washington, D. C. • Gloucester, Mass.
San Francisco, Calif. • Houston, Texas • Seattle, Wash.
Los Angeles, Calif • Chicago, Illinois • St. Louis, Mo.
San Diego, Calif • New Orleans, Louisiana • Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia.

Make Your Own Repair Parts

IN HOURS INSTEAD OF DAYS

WITH

La Salle

STRESSPROOF®

THE HIGH-STRENGTH, ALL-PURPOSE STEEL BAR

You can *make your own* replacement shafts, spindles, screws, and other machinery repair parts *quickly* . . . right in your own plant from STRESSPROOF, the all-purpose steel bar.

With STRESSPROOF, you simply machine the part you need, then install it. That's all . . . no heat treating, no straightening, no carburizing! You're back in operation in hours, not days.

And there's no need to worry about *what* steel to use . . . the qualities you need are built-in. STRESSPROOF is *as strong as* heat-treated steels of equal hardness; *wears better* than many heat-treated carbon or alloy steels; and *machines easily* . . . 50% to 100% faster than carbon or alloy steels of equal hardness.

STRESSPROOF is stocked by leading steel warehouses from coast to coast.

Write for your free copy of this helpful new brochure, "Make Your Own Repair Parts."

La Salle STEEL CO.

1414 — 150th Street · Hammond, Indiana

Phone: Sheffield 6090

Exterior view of screw nut machined from steel bar stock:
Cost finished
$5.60
each
Cutaway view of nut redesigned as a cored, Gray Iron casting:
Cost finished 90¢
each

83% saving with Gray Iron

A saving of over 80% on original cost by redesigning in Gray Iron! Also, longer life and improved operating characteristics are provided by the cast part.

This happens every day... someone decides to adopt Gray Iron and confirms its engineering advantages. Have you?

Call your nearest Society member foundry and the full facilities of this association will be available to help you. Or, write direct to Gray Iron Founders' Society, Inc., National City-E. 6th Bldg., Cleveland 14, Ohio, for helpful technical and business information.

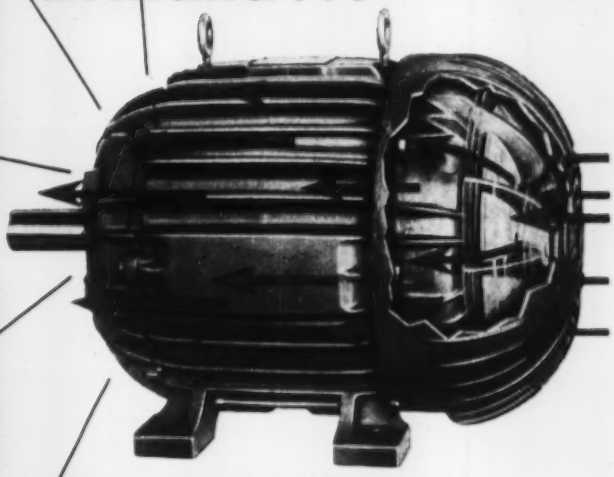
MAKE IT BETTER WITH GRAY IRON

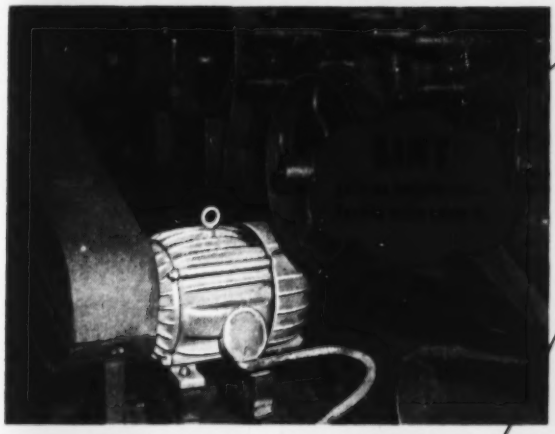
This symbol assures you the most for your casting dollar

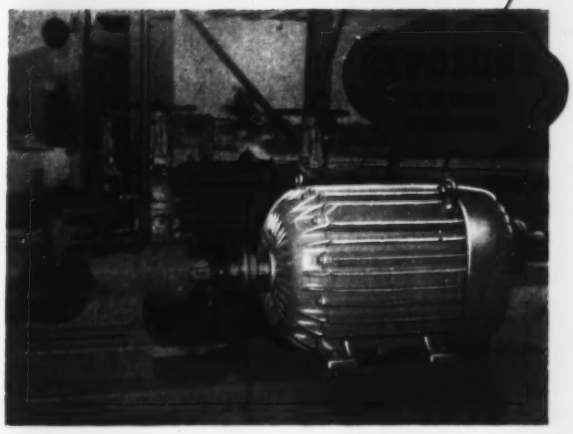
Here's why it pays to call in one of the more than 500 leading foundries displaying the Society symbol:

- The most recent technical and business information is available to each member through the Society to help you design better products at lower cost.
- The use of sound cost accounting procedures is recommended and encouraged among Society member foundries, assuring full value for your casting dollar.
- Improved castings result from the advanced techniques and the high sense of responsibility of Society members.

GRAY IRON FOUNDERS' SOCIETY







Tough conditions demand...

ELLIOTT C-W *Sealedpower* MOTORS

The ribbed frame provides effective heat radiation . . . The fan-driven cowl-directed air-blast carries off the heat, and also prevents the settling of dust on the motor frame, which would tend to reduce heat dispersion . . . The streamlined fan has no corners to collect dirt . . . Cowl can be quickly removed if or when necessary. Here is a TEFC motor you can put anywhere. Wide range of modifications for specific needs. Sizes 1 to 100 hp, NEMA frames. Ask your local Elliott representative for full data, or write for bulletin to Elliott Company, Crocker-Wheeler Division, Ampere, N. J.

ELLIOTT Company

W4-1

STEAM TURBINES • MOTORS • GENERATORS • DEAERATING HEATERS • EJECTORS

CONDENSERS • CENTRIFUGAL COMPRESSORS • TURBOCHARGERS • TUBE CLEANERS • STRAINERS

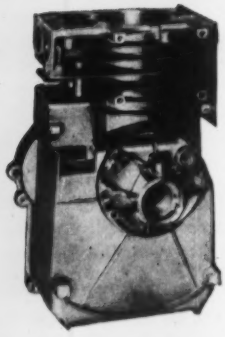
AJAX INDUCTION FURNACES

BRIGGS & STRATTON CORPORATION

1,000,000
INDUSTRIAL
ENGINES

4 CYCLE
BRIGGS & STRATTON
GASOLINE ENGINES

With holding furnaces of 20 kW similar to that in the photo above, and melting furnaces of 100 kW, Briggs & Stratton Corp., Milwaukee, Wisc., is getting increased production under cleaner, more satisfactory working conditions than ever before, *and at lower operating costs.*



The intricate die-cast aluminum cylinder shown at the left is one of many produced at the B & S plant from high grade aluminum alloy melted in low-frequency AJAX induction furnaces. In these furnaces *only the metal is heated.* Energy is transmitted to the molten charge without actual contact through the refractory walls. There are no resistors or other parts having a higher temperature than is absolutely necessary for properly melting the charge. Overheating is avoided, and there is practically no oxidation.

The holding furnaces next to the die-casting machines as well as the melting furnaces are automatically controlled at a temperature within ±5°F., holding the metal at the lowest feasible casting temperature. The agitation due to internal electrical stirring in the metal gives the best conditions for holding furnaces, and there is little possibility of sludge formation at the bottom, because this is where the heat is generated.

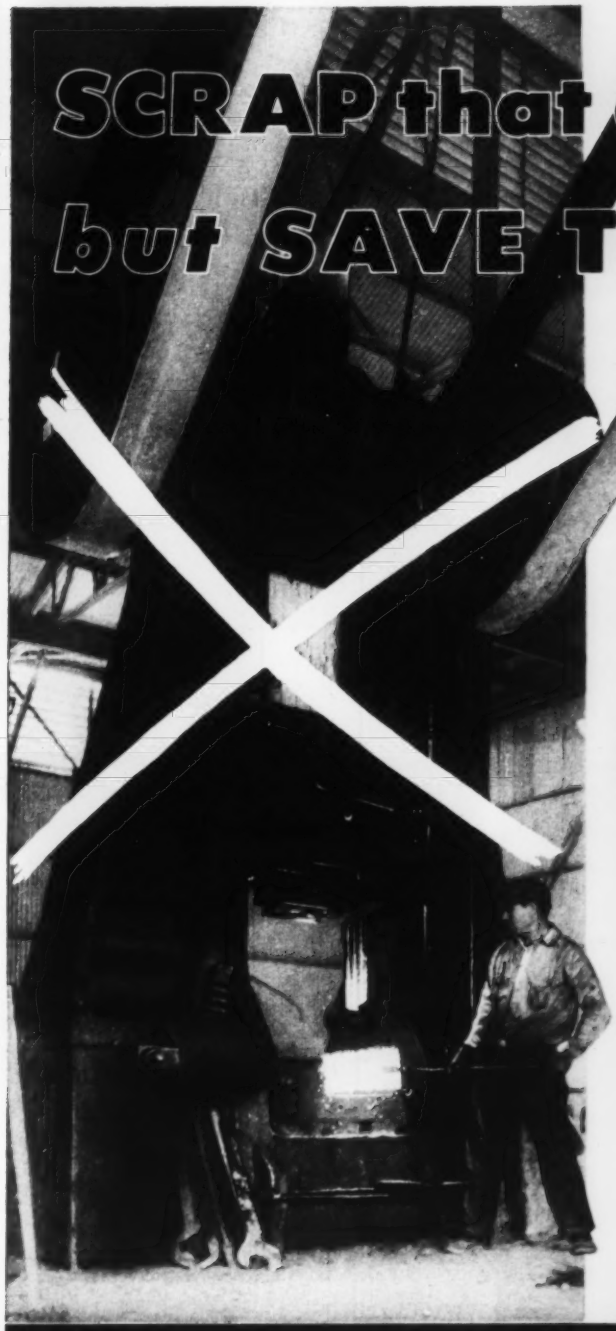
Write for Further Information to

AJAX ENGINEERING CORP., TRENTON 7, N. J.

AJAX
TAMA-WYATT

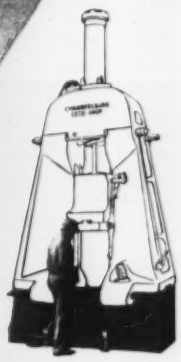
INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Hultgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting



SCRAP that old hammer but SAVE THE ANVIL!

MOUNT A CECO-DROP UPPER-WORKS ON IT



To meet competition, your best bet is to scrap your old unproductive gravity drop hammers and install Ceco-Drops, the most modern, most productive drop hammers ever built. And for quick changeover at minimum cost, you can have Ceco-Drop upper-works fitted to your present anvil. You have all the benefits of modernization without the time and expense of replacing the anvil or disturbing the foundation.

Write for Bulletin 57-L-4

CECO-DROP

Made by the BUILDERS of THE IMPACTER

CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

Which is the CleCap?

...the unusually LARGE one that's hard to find

One of the advantages CleCap customers enjoy is the knowledge that when they want some of those BIG cap screws, the chances are 9 out of 10 we can ship them the same day.

CleCap makes 'em regularly from ¼" to 2½" diameters, any length you want—ferrous and non-ferrous—and we stock a lot of unusual sizes, nearly 10,000 different items last count.

That's another reason for dealing with *The* cap screw specialists of the country. You also get unbeatable top-quality fasteners . . . PLUS a CleCap crew that has a long-made rep for "busting a leg" to get you what you want exactly when you want it.

What happens to your profits when late deliveries hold up production lines? Put your cap screw needs up to CleCap . . . and relax!

The Cleveland Cap Screw Co.
2935 EAST 79TH STREET • CLEVELAND 4, OHIO
VU Ican 3-3700 TWX CV42

WAREHOUSES:
Chicago • Philadelphia • New York
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CLEVELAND *Top Quality* FASTENERS

Ferrous and Non-Ferrous: Bright, High Carbon and Alloy Steel Heat Treated, Brass, Silicon Bronze, Stainless Steel

Hex Head Cap Screws: ¼" to 2½" dia.
Socket Head Cap and Set Screws—Plain and Knurled: ¼" to 1½" dia. Also Flat and Button Head Styles.
Flat Head Cap Screws: ¼" to 1" dia.
Fillister Head: ¼" to 1¼" dia.
Set Screws—Square Head: ¼" to 1½" dia.
Milled Studs: ¼" to 1¼" dia.
Place Bolts: ¼" to 1¼" dia.
Structural Bolts to ASTM Specification A325
Tractor Bolts
Special Hot and Cold Headed Parts

Facilities to make larger diameters than listed.

Ask your jobber for CleCap!

Originators of the Kaufman DOUBLE EXTRUSION Process

Bill—
Sounds good—
get duPont to
tell us more
about it!
Hal

NEW

This all-purpose Vapor Degreasing Solvent can help you cut cleaning costs ...and it "costs no more"!

DU PONT

E. I. DU PONT DE NEMOURS & COMPANY (INC.)
ELECTROCHEMICALS DEPT., WILMINGTON 98, DELAWARE

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

PROGRESS for real "POWER" grinding!

NEW

SAF-T-CUT "BZ" Reinforced Disc-Wheel

Fibreglass Reinforcement
Specially treated Nylon Mesh
Layers of Fast Cutting Abrasive
Fibreglass to support area around hole and hub

Again BAY STATE progress opens new horizons in faster, safer heavy-duty portable grinding. Saf-T-Cut "BZ" disc-wheels are reinforced with multi-layer fibreglass and specially treated nylon.

Give "BZ" disc-wheels all the power you have! Run them at maximum recommended speeds! They have been "built" to withstand heavy-duty grinding . . . with long wheel life. Extensive tests on weld grinding jobs have produced record breaking results.

Get the fastest heavy-duty cutting action, the greatest disc-wheel strength, the maximum wheel life . . . *plus* a range of hardnesses from which to choose the one you need. Saf-T-Cut "BZ" is Bay State's *latest* "Wheel of Progress"!

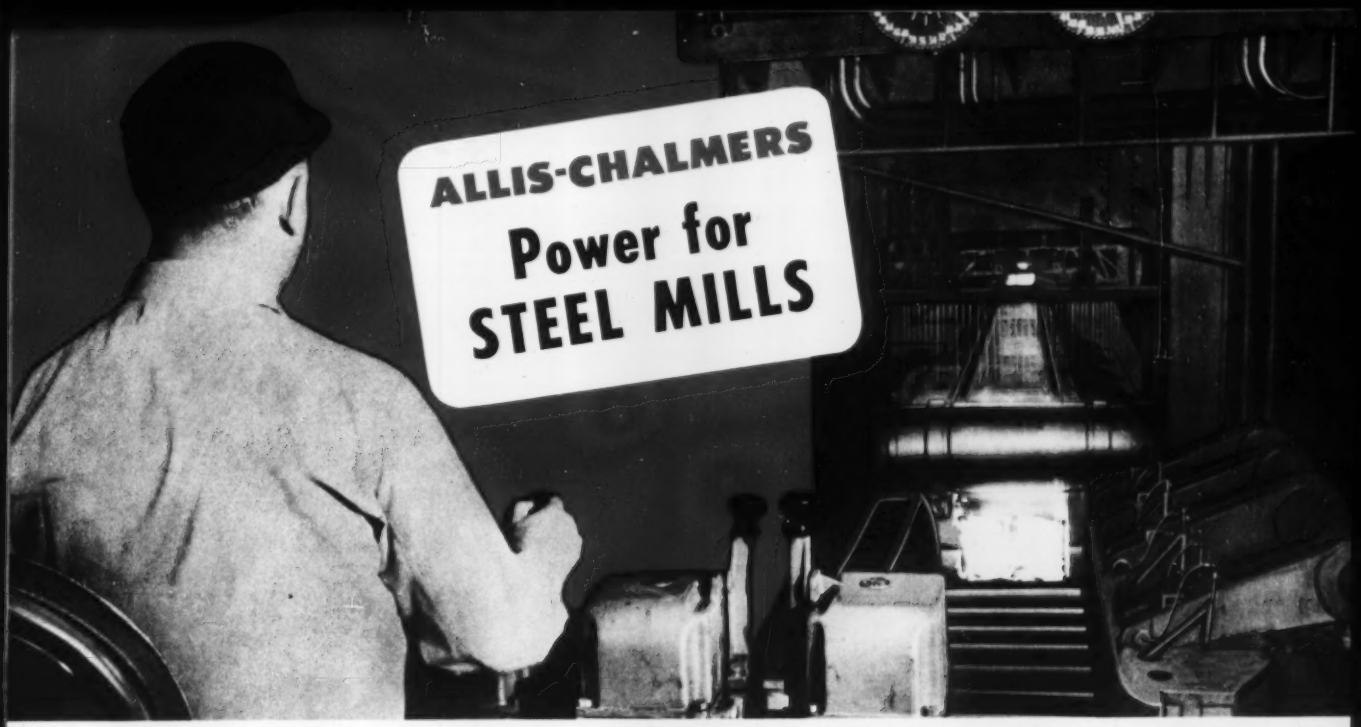
ASK FOR A DEMONSTRATION ON YOUR WORK.

BAY STATE WHEELS of PROGRESS

BAY STATE ABRASIVE PRODUCTS CO., Westboro, Mass., U. S. A.

Branch Offices and Warehouses — Chicago, Cleveland, Detroit, Pittsburgh
Distributors — All principal cities
In Canada: Bay State Abrasive Products Co. (Canada) Ltd., Brantford, Ont.

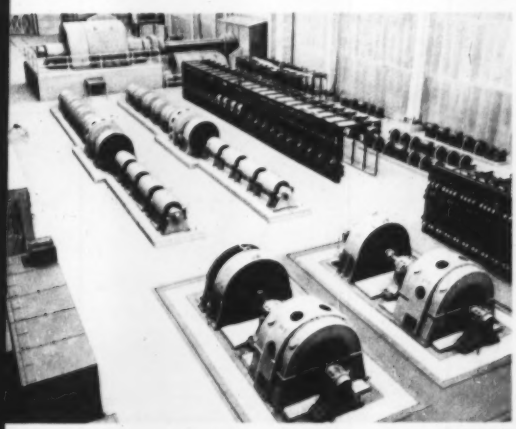
Manufacturers of all types of Quality Abrasive Products



Blooming mill as seen from the main pulpit. All electrical equipment supplied by Allis-Chalmers.

Granite City Modernization Cuts Operating Costs

Allis-Chalmers supplied complete electrical requirements for $82,000,000 program to reduce production costs and expand capacity. Motors, m-g sets, control, substations, power transformers, switchgear and other major electrical equipment included.



Blooming mill motor room showing switchgear, control, m-g sets, *Regulex* m-g sets, liquid rheostat and twin-drive motors.

Years ago, farsighted Granite City Steel Company saw the need to modernize their facilities to keep pace with the growth of their market and to take advantage of cost-reducing developments in steel making. They laid out a 7-year, $82,000,000 plan for bringing their plant to top efficiency and low cost operation.

From the beginning, Granite City worked with Allis-Chalmers steel mill specialists to design an electrical system which would give them low cost production, great flexibility and dependable operation. Allis-Chalmers offered many suggestions, born of a thorough knowledge of steel mill electrical problems, which helped Granite City to achieve their goal.

Now, in the midst of a strongly competitive era, Granite City has a modern, high production, low cost, integrated mill ready to meet the challenge.

What about your mill?

Has heavy competition squeezed the profit out of steel made on outdated equipment? Would modernized, low production cost facilities make your profit picture brighter? Talk over your problem with your Allis-Chalmers representative. Or write Allis-Chalmers, Milwaukee 1, Wisconsin. A-4517

Regulex and *Texrope* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

Milwaukee 1, Wisconsin

New Allis-Chalmers M-G SETS,

Four Mills are Backbone of

1

Blooming Mill

Left: 8000-kw, 514-rpm flywheel motor-generator set supporting 5000-hp twin-drive blooming mill motors. Set consists of four 2000-kw, 700-volt, 514/436-rpm generators . . . a 7000-hp, 6900-volt, 514-rpm induction motor . . . and a 192-inch, 213,500-hp/sec flywheel.

Center: Constant voltage dc control panels in the blooming mill motor room. Panels utilize Allis-Chalmers Type 260 dc contactors.

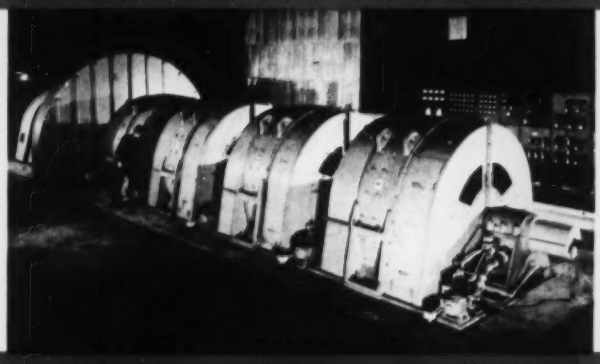
Right: 10,000-hp twin-drive consisting of two 5000-hp, 700-volt, 40/80-rpm blooming mill motors with supporting flywheel m-g set, exciter set and liquid rheostat for flywheel set wound-rotor motor in background.

Hot Strip Mill

Left: 8000-kw, 514-rpm flywheel motor-generator set supporting hot strip mill motors. Set consists of four 2000-kw, 700-volt, 514/436-rpm generators . . . 7000-hp, 6900-volt induction motor . . . and a 192-inch, 213,500-hp/sec flywheel.

Center: Exciter and *Regulex* sets and control panel in motor room for reversing roughing stand of hot strip mill.

Right: Roughing mill twin-drive for hot strip mill. 7000 hp obtained from two 3500-hp, 700-volt, 40/80-rpm motors.



Cold Reduction Mill

Left: 7750-kw, 514-rpm motor-generator set supporting cold reduction mill motors. Set consists of three 2000-kw, 750-volt, one 1250-kw, 750-volt, one 500-kw, 750-volt generators . . . 12,000-hp, 6900-volt, 514-rpm drive motor.

Center: Here is the variable voltage control board for the 56-inch tandem cold reduction mill.

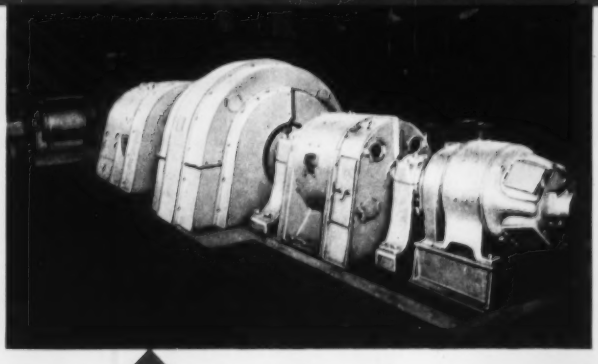
Right: 600-hp delivery reel motor, three 2500-hp main stand motors, and 1500-hp first stand motor.

Temper Mill

Left: 1165-kw, 720-rpm, 4-machine motor-generator set supporting 48″ temper mill drive. Set consists of 1750-hp, 6600-volt synchronous motor driving one 1000-kw, 600-volt generator . . . one 125-kw, 250-volt generator . . . and one 40-kw, 250-volt generator.

Center: *Regulex* set and control board for 48″ temper mill. Control for this two-stand mill was rebuilt to fit into existing enclosure for single-stand mill control.

Right: Drive motors shown include 500-hp, 600-volt, 177/500-rpm main roll drive motor for No. 2 stand, 300-hp, 650-volt, 250/625-rpm upper delivery tension motor, 150-hp, 650-volt, 250/625-rpm lower delivery tension double-armature motor and 150-hp, 250-volt, 400/1200-rpm delivery reel motor. Complete two-stand mill is Allis-Chalmers motor driven. Similar Allis-Chalmers m-g sets, controls and motors operate a single-stand, 56″ temper mill.



A-C ALLIS-CHALMERS

ALLIS-

CONTROL and MOTORS for all

Electrical Modernization at Granite City

2

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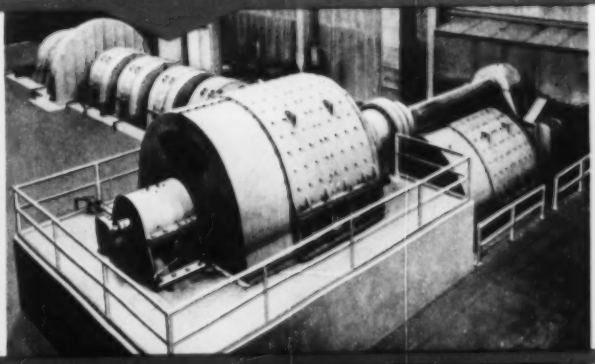
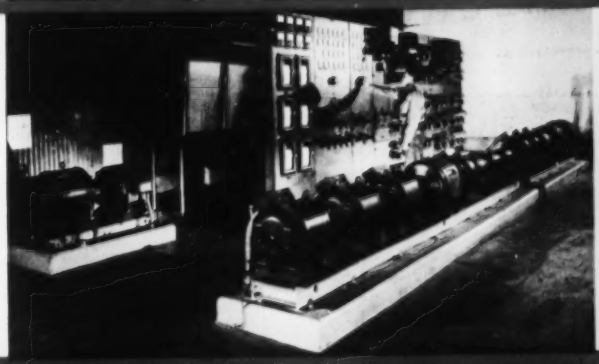
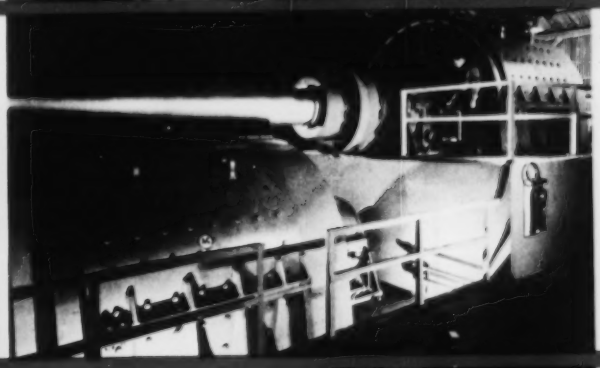
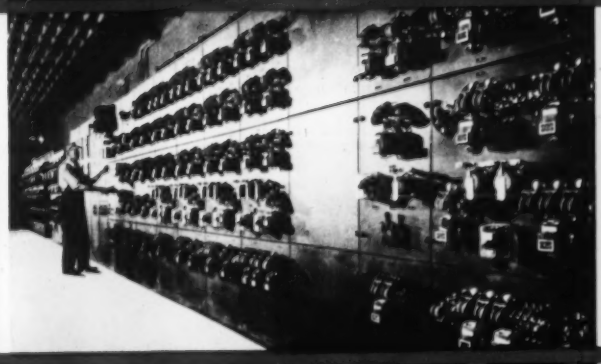
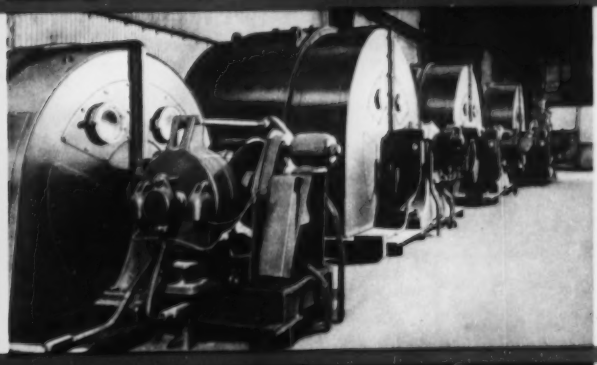
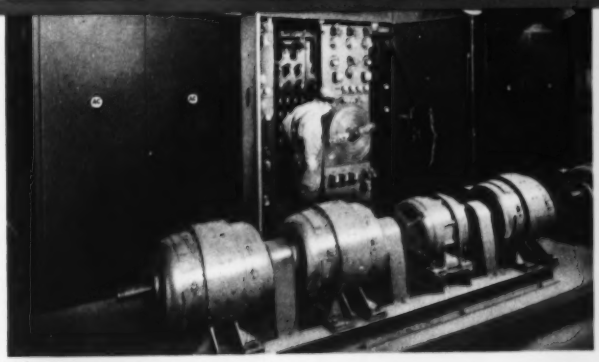


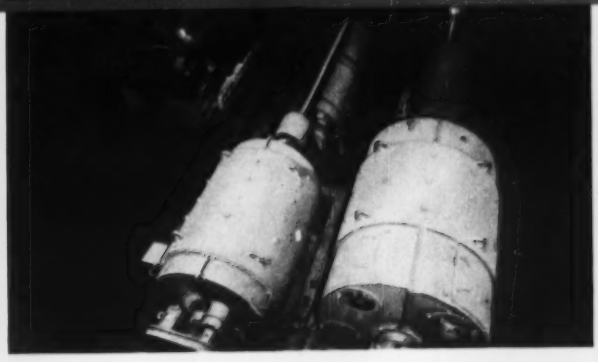




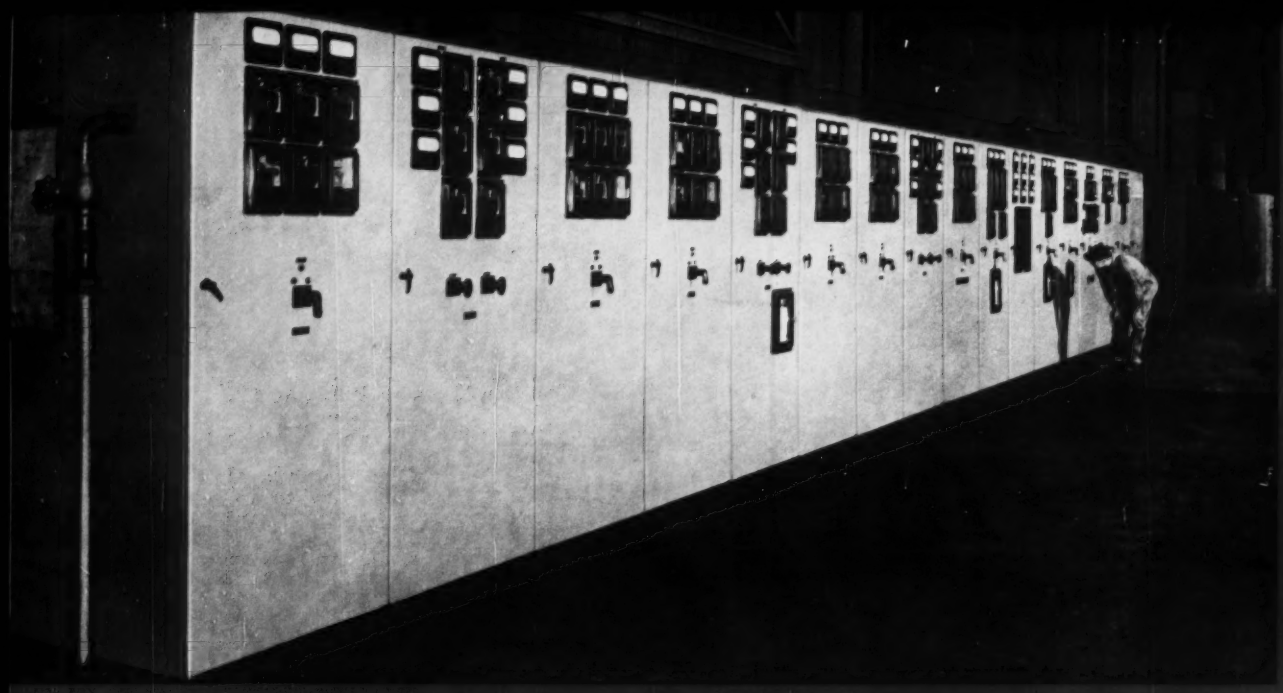






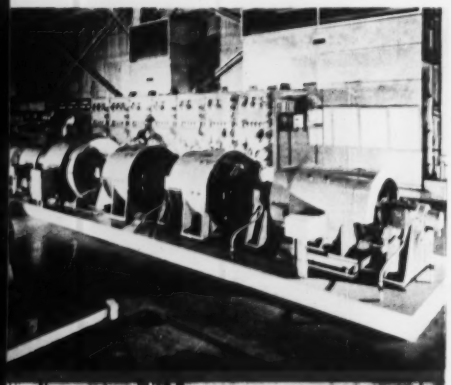


CHALMERS



6900, 440 and 480-volt metal-clad ac switchgear for the blooming mill's 10,000-hp, twin-drive motors (5000 hp each). This is one of many power centers in the Granite City plant supplied by Allis-Chalmers.

More Allis-Chalmers Equipment Installed At Granite City Steel Co.

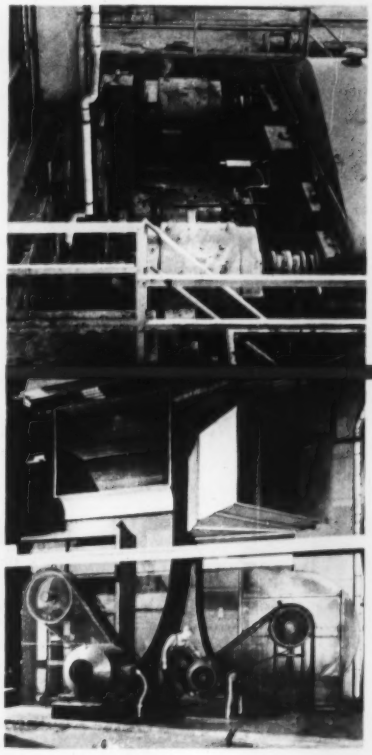


Control for variable voltage m-g set, 900-hp synchronous motor and supporting generators for mill tables, feed rolls and delivery tables in the hot strip mill.

500-hp, 230/460-volt, 375/750-rpm motors used to drive up-and-down cut slab shears in the blooming mill. All auxiliary drives in the installation were supplied by Allis-Chalmers.

Pump room for descaling water for hot strip mill. Motors are 500 hp, 3600 rpm. Pumps are Allis-Chalmers 5x4, 7-stage units rated at 600 gpm.

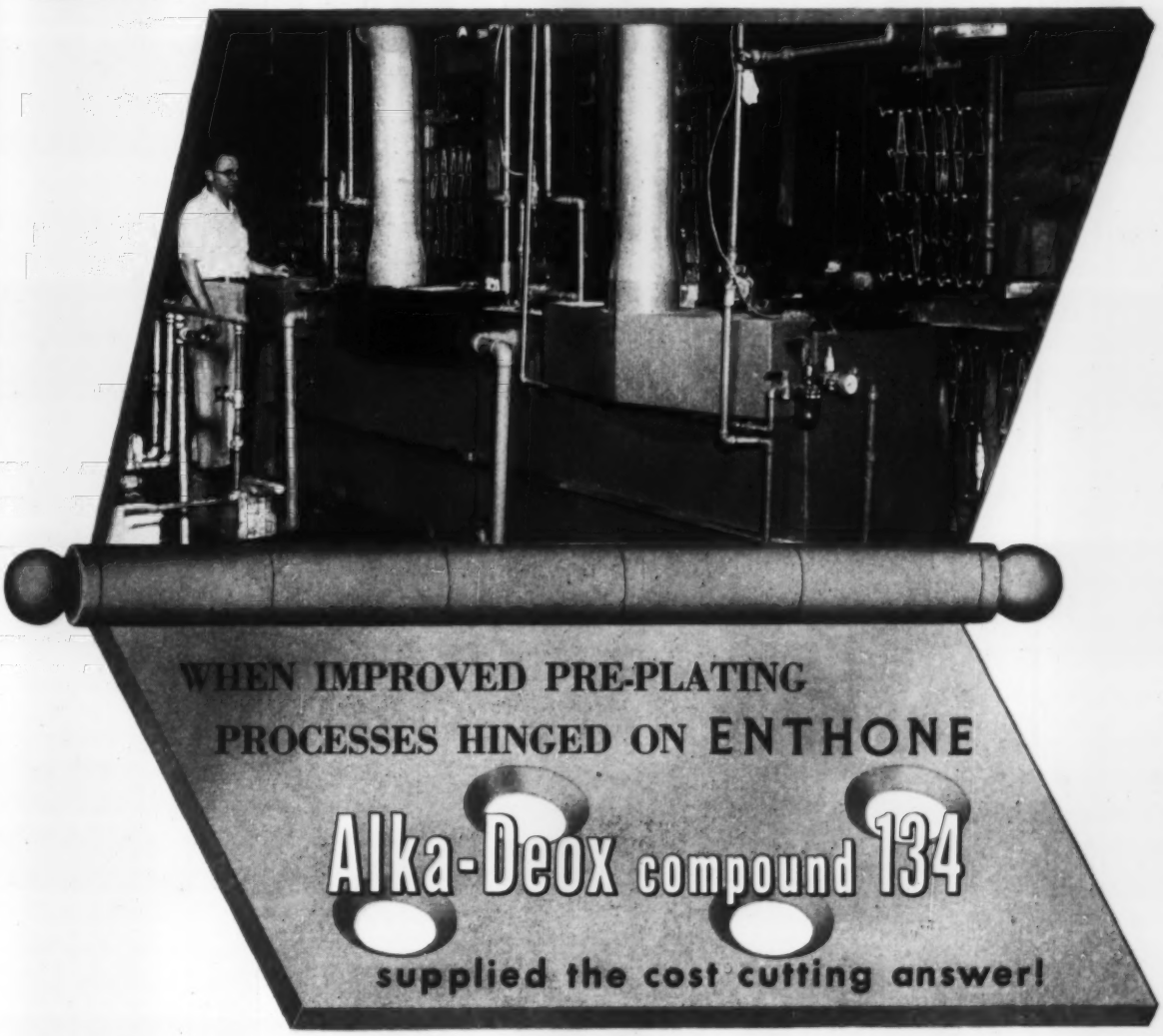
Two Allis-Chalmers totally-enclosed, fan-cooled motors used to drive blowers. Motor at left is 125 hp, motor at right is 75 hp. *Texrope* drives were also supplied by Allis-Chalmers.



ALLIS-CHALMERS

Milwaukee 1, Wisconsin

Enthonics AT WORK at C. HAGER & SONS HINGE MFG. CO.



WHEN IMPROVED PRE-PLATING PROCESSES HINGED ON ENTHONE

Alka-Deox compound 134

supplied the cost cutting answer!

C. Hager & Sons Hinge Manufacturing Company, St. Louis were experiencing periodic rejects due to incomplete cleaning and pickling in the pre-plating processes employing alkali cleaning and acid pickling.

Enthone's chemists and metallurgists applied *Enthonics* to the problem. The answer was the use of Alka-Deox Compound 134 in place of the acid dip in three fully-automatic plating machines.

THE RESULTS? Using the Alka-Deox process, Hager reported: "Soak cleaning and cyanide dip completely eliminated . . . Flash rust no longer a problem . . . Laboratory analysis cut to one a month . . . Solution operating-life of 5 months — and more — compared with the former use of 6 carboys of muriatic acid each week . . . Annual materials-cost savings of $391.50 on just three machines . . . Labor and maintenance savings . . . Reduced down time . . . And the complete elimination of plating rejects due to incomplete cleaning and/or pickling!"

Enthonics at work has *proved* its value to Hager. And if production improvements in your plant hinge on improved metal-pre-plating processes, contact Enthone's Research Department — *today!* Why not put *Enthonics* to work for you?

**The Scientific Solution of Metal Finishing Problems.*

ENTHONE
INCORPORATED

METAL FINISHING PROCESSES

442 ELM STREET, NEW HAVEN 11, CONNECTICUT

ELECTROPLATING CHEMICALS

Service Representatives and Stock Points: BINGHAMTON, N. Y., Austin F. Fletcher, Inc.; CHICAGO, Ardco, Inc.; CLEVELAND, R. O. Hull & Co. DALLAS, Weaver Engineering & Supply Co., Inc.; LOS ANGELES, L. H. Butcher Co.

SALES SKYROCKET!

Dramatic Increase in Permanente 165 Open Hearth Bottoms Installed in Last 2½ Years!

HERE's hardboiled evidence that Permanente 165 *Periclase* Ramming Mix is now regarded by leading steel producers as the world's highest quality material for open hearth bottoms:

After years of development, by 1951 Permanente 165 had gained widespread acceptance. During the succeeding 2½ years, the number of Permanente 165 bottoms installed in U. S. open hearths has more than quadrupled!

This increasing demand is the result of Permanente 165's unmatched *performance* which results in far *fewer bottom repairs*—and more tonnage at *lower bottom cost!*

Let your Kaiser refractory engineer provide *you* with research, design, and installation service to help you obtain all the quality advantages of Permanente 165 *Periclase* ramming mix.

Call or write Kaiser Chemicals Division, *Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway,* OAKLAND *12, California . . . First National Tower,* AKRON *8, Ohio . . . 518 Calumet Bldg., 5231 Hohman Avenue, Hammond, Indiana* (CHICAGO).

Kaiser Chemicals

Pioneers in Modern Basic Refractories

Refractory Brick and Ramming Materials • Dolomite • Magnesia • Magnesite • Alumina • Periclase

HERE'S MONEY SAVING TIP #3

from the GOULD Plus-Performance Plan

HOW TO CHANGE CHARGING PLUGS

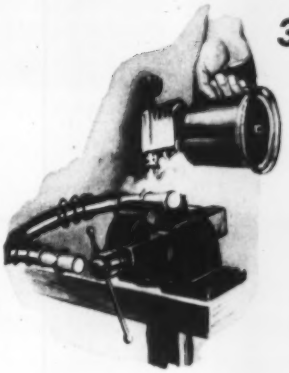
Although plugs and receptacles are of rugged design, they are not indestructible and can be damaged by misuse. Also, it may be necessary to change the size or type of plug. The Gould Plus-Performance Plan shows you how in three, simple, easy steps.

1. Break Circuit by Removing a Connector

This opens the circuit and prevents short circuit, which might cause accidental injury to personnel or equipment.

2. Remove Lugs and Replace

Terminal lugs are held in the plug by bolts or screws which, when removed, will permit the lugs to be withdrawn for replacement. After withdrawing cable and lugs from plug, should it become necessary to replace lugs, heat enough to melt solder sufficiently to free lugs from cable. Clean and tin wire . . . place in terminal and re-solder.



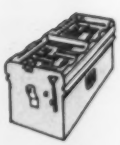
3. Reassemble Terminal Lugs in Charging Plugs

In reassembling cables into plug, make sure that the negative wire is placed in the negative side and the positive wire in the positive side. If the terminal leads are reversed in reassembling, the battery will be placed on charge in reverse and badly damaged.

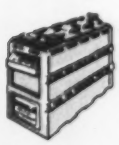
GOULD Batteries

GOULD-NATIONAL BATTERIES, INC.
TRENTON 7, N. J.

For Railroad Air Conditioning and Lighting


For Mine Shuttle Cars and Locomotives

For Electric Industrial Trucks


For Diesel Locomotive Starting

For Standby and Emergency Power

©1954 Gould-National Batteries, Inc.

Always Use Gould-National Automobile and Truck Batteries

There are many ways in which you can cut battery maintenance costs. Doing simple jobs like this, in your own plant, is the answer. The Gould Plus-Performance Plan gives you the "know-how" to "do it yourself." Send for the complete plan and start saving money. Mail this coupon TODAY!

BATTERY INFORMATION HEADQUARTERS
Dept. S-124 Trenton 7, N. J.

Please send me, without charge or obligation, the Gould Plus-Performance Plan for _____ batteries.
(type or types)

Name _____

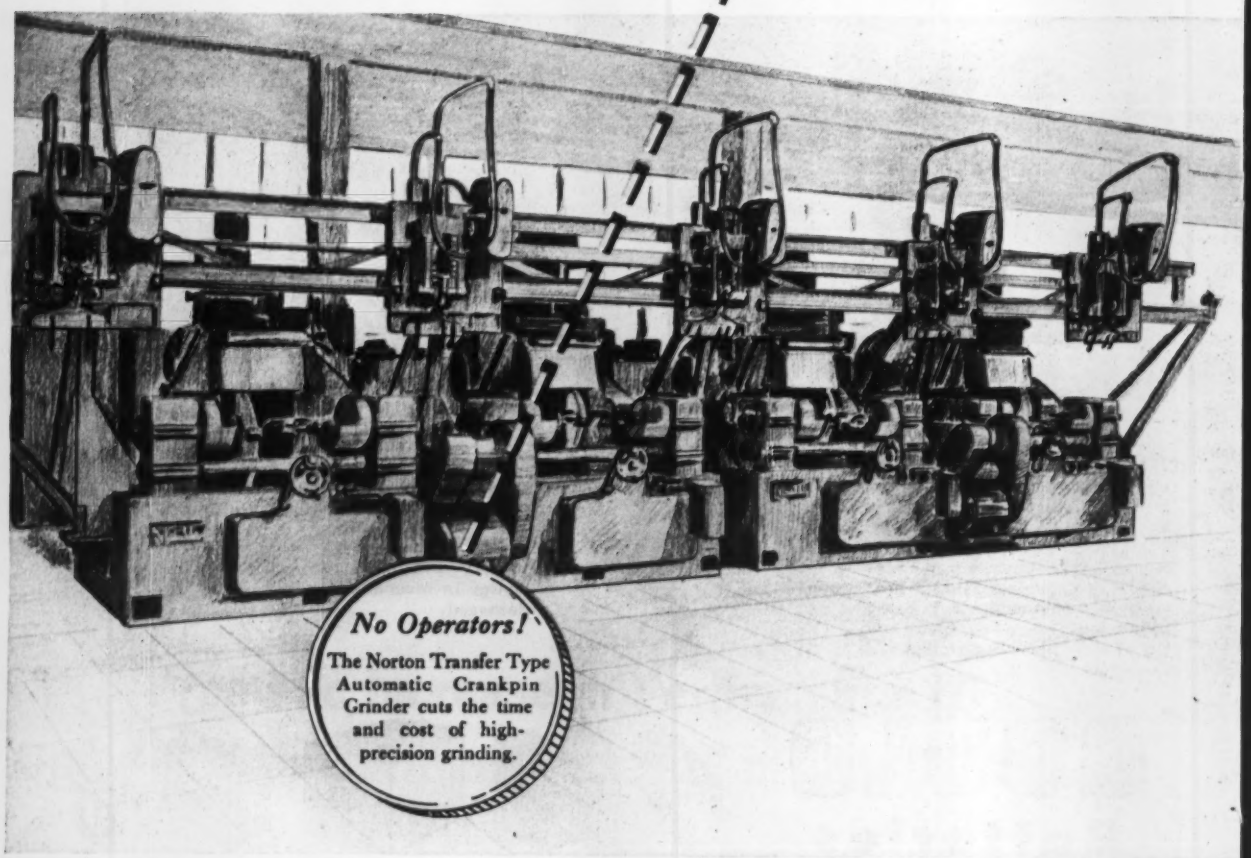
Firm _____

Address _____

City _____ Zone _____ State _____

Norton Introduces AUTOMATION IN CRANKPIN GRINDING

Cuts Production Costs



All the operators' manual duties now mechanized in crankpin grinding

It was a good question:

Can an operation as intricate and exacting as grinding a crankpin be done by automated machines?

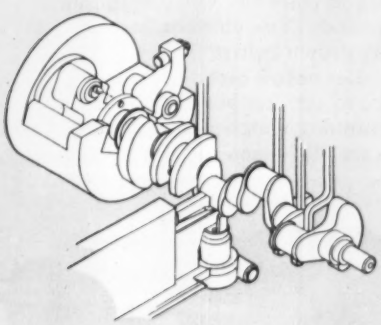
The question is a question no more.

Norton has answered it, "Yes."

Now *all* the manual motions once required of operators are handled automatically. Norton's modern machine for this really tough cylindrical grinding job does all adjusting, controlling, gauging and transferring of the work — plus the rapid, low-cost, high precision grinding required.

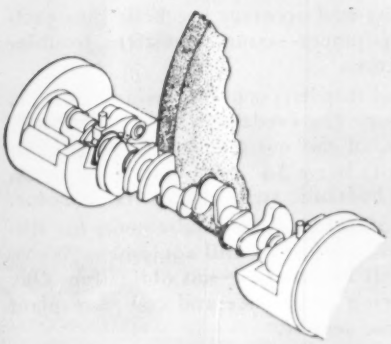
It is another Norton first. Norton is making rapid progress in applying Automation to various types of grinding.

4-way automation in new Norton machine



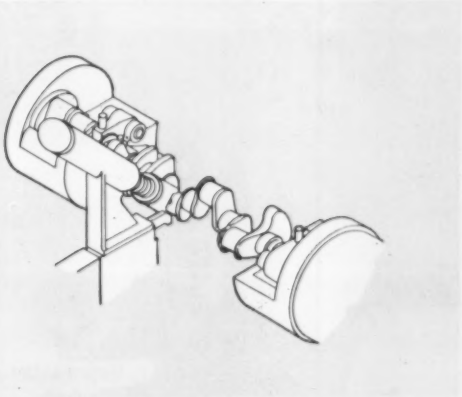
1. It adjusts automatically

Norton Automation locates the work in the grinder both angularly and longitudinally by built-in mechanism . . . grinding wheels are trued automatically . . . automatic compensation for reduction in wheel diameter is made by the feeding mechanism.



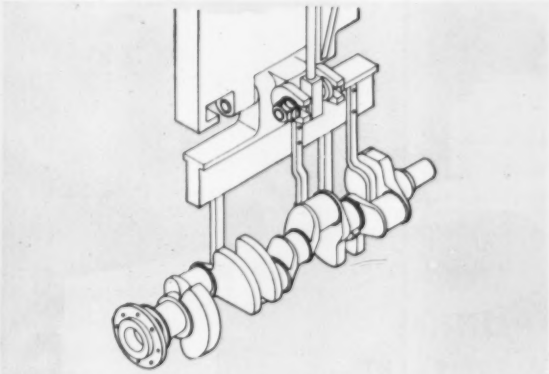
2. It grinds automatically

Being completely automatic, the grinders operate close to 100% efficiency all the working day. They can be pre-set to operate at a definite rate of production continuously. The unit can be controlled, when necessary, to by-pass any inoperative station.



3. It gauges automatically

Spark-out and work size are controlled by an electric gauge which contacts the work during grinding and automatically terminates the cycle by retracting the wheel slide when size is reached.



4. It transfers automatically

Five transfer units travel vertically to pick up and deposit the crankshafts at each station, moving simultaneously. These units are joined together, moving in unison horizontally to transfer the work between stations. The final unit carries ground crankshafts out of transfer machine.

New Automated Grinders Soon to Come . . .

This crankpin grinder is only one of many Norton advances in Automation. For more information about this and other Norton Automated Grinders, write Norton or see your Norton representative. And remember: only Norton offers you such long experience in both grinding machines and grinding wheels to help you produce more at lower cost. For more information, write NORTON COMPANY, Worcester 6, Massachusetts.

To Economize, Modernize with **NEW**

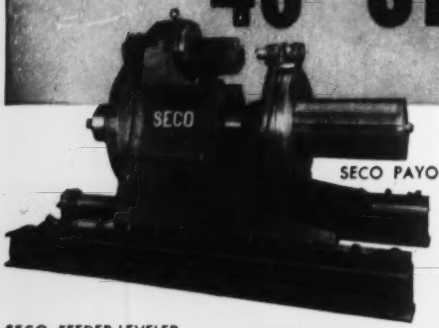
NORTON

GRINDERS and LAPPERS

Making better products . . . to make other products better

District Sales Offices: Worcester • Hartford
New York (Peterboro, N. J.) • Cleveland • Chicago • Detroit

Big, New HEAVY-DUTY SECO 48" SLITTING LINE



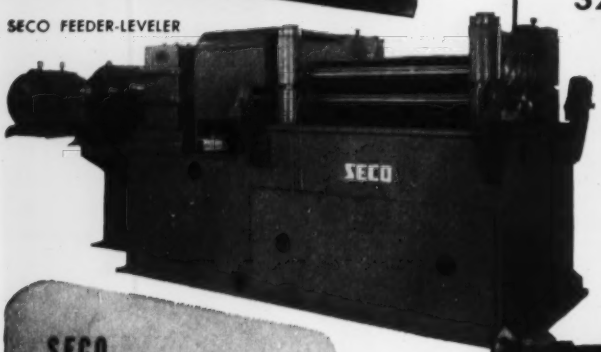
SECO PAYOFF REEL

Sets New Standards

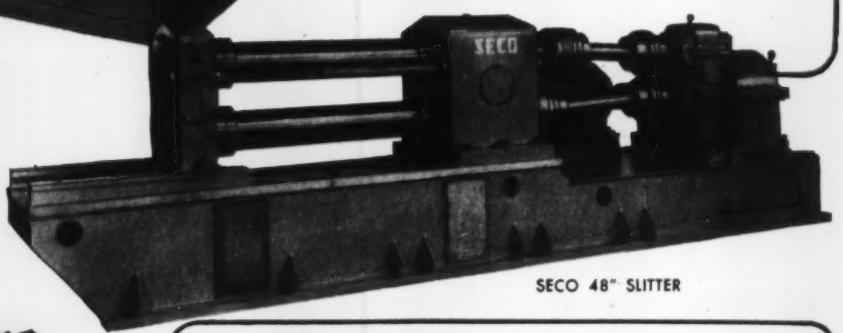
- in Performance and Production
- in Fast, Profitable Operation
- in Safe Handling of Coils Up to 32,000 Pounds

This rugged new SECO Slitting Line handles steel ¼" thick in coils 48" wide, weighing up to 32,000 pounds. The efficient, streamlined SECO Slitter, shown below, makes seven cuts in .250" stainless or low carbon steel at slitting speeds of 100 to 400 feet per minute. This slitter has overrunning clutches for pull-thru slitting. Arbors are 9½" diameter with 16" knives.

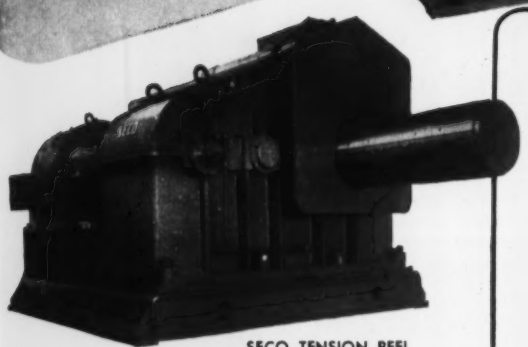
SECO FEEDER-LEVELER



SECO SLITTING EQUIPMENT— the latest in design, engineering and efficiency



SECO 48" SLITTER



SECO TENSION REEL

Exceptional quality and accuracy are built into each piece of SECO equipment—assuring efficient, trouble-free, high production.

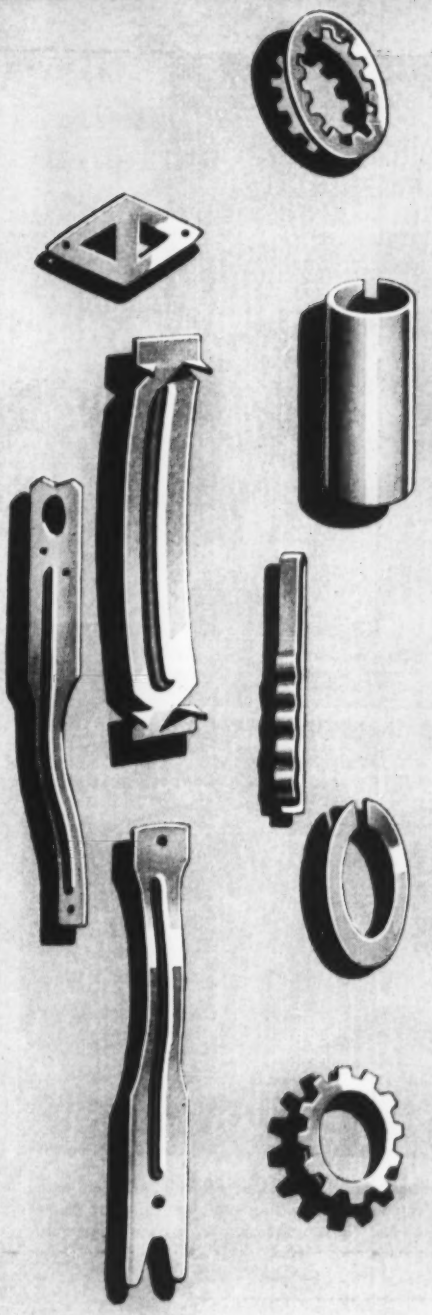
The Payoff Reel (top left) is of the positioning type, with power feed-up. The Feeder-Leveler is, like other SECO equipment, of the most modern design. The Tension Reel (left) has a 54" long automatic block, 22" in diameter, hydraulic stripper, 250 H.P. motor.

Call or write SECO on your requirements for slitters or other cold-rolled strip mill equipment. We're glad to furnish full information—no obligation. Our years of engineering experience and complete plant facilities are at your service.

SECO

STEEL EQUIPMENT CO.

20805 AURORA ROAD • CLEVELAND 22, OHIO



For easier blanking or forming...depend on the uniformity of

WEIRTON

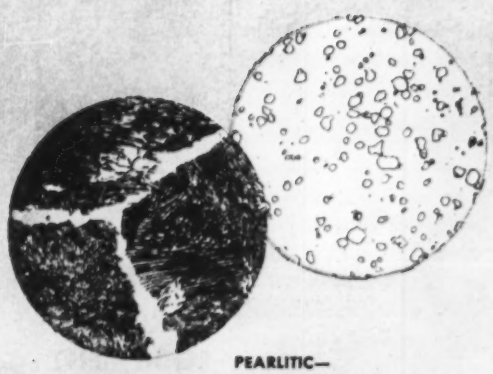
High-Carbon Strip Cold-Rolled Spring Steel

The requirements of high-speed cold forming or blanking are met consistently by Weirton cold-rolled spring steel. Formulated to exact specifications for each job, it makes the operation easy and economical for products in which high fatigue resistance is essential.

To an unusual degree, Weirton high-carbon strip cold-rolled spring steel possesses these highly important characteristics:

- **Uniform chemical and physical properties**
- **Exact consistency of grain structure**
- **Accurate response to heat treatment**
- **Exceptional uniformity of gauge and width**
- **Controlled decarburization limits**

It is supplied with the desired chemical composition and for specific heat treating and hardness ranges in strips up to seven inches wide.

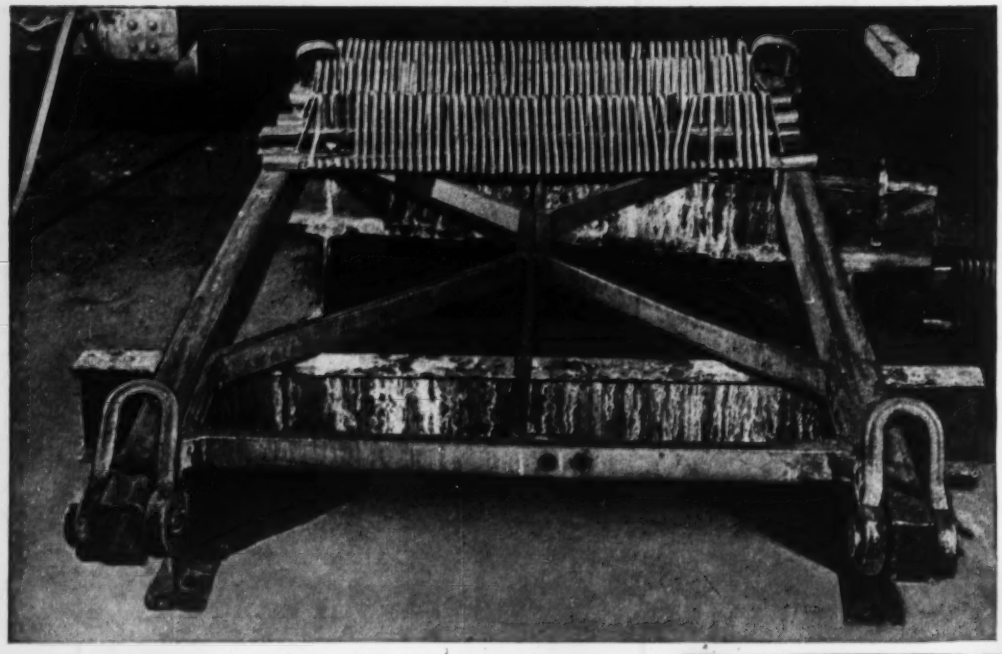


SPHEROIDIZED—
Annealed, soft and ductile. Ideal for cold forming operations.

PEARLITIC—
Temper-rolled in controlled hardness and strength for blanking.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION



One of the Veterans posed to show condition of the Monel. Racks on rear of pickling crate hold flats in position for pickling. They're Monel, too. This crate is being repaired by Strohecker, Inc., Enon Valley, Pa., for still more service.

How much More Life do you think there is in this 25 year-old Monel Pickling Crate?

Look it over well!

Check the edges of those old rivet holes! Look at the joints! See what shape the members are in . . . and the lift yokes and pins!

To be fair, we should tell you that the crate has been repaired now and then by Strohecker, Inc. and, as you see, it's welded now, not riveted. We had better say, too, that it is one of 12 left . . . out of 14 Monel® crates bought in 1928.

There is some mystery about those other two crates. No one at Sharon Steel Corporation recalls their exact fate. Perhaps they were damaged somehow and the master mechanic used the Monel to make something else. At any rate, they're gone.

But you can see that this crate has a lot of life left. So have the other eleven. So have thousands of other pieces of Monel pickling equipment used by the iron and steel industry . . . racks, baskets, chains, hooks, stay-rods, and bands.

That is why it is safe to say that Monel is probably the most economical alloy you could use in most kinds of pickling equipment. A little Monel goes a long way. You can make it any shape you want easily. It lasts a long time.

THE INTERNATIONAL NICKEL COMPANY, INC.

67 Wall Street New York 5, N. Y.

Going Over the Top and into sulphuric acid bath. Support for pickling crate provided by Monel hooks. Notice corrosion of surrounding equipment not of Monel.

To get more information on places to use Monel in pickling send for the free booklet, "Five Way Savings . . . in Pickling."

INCO TRADE MARK

extra life
extra capacity
extra safety

Monel
PICKLING EQUIPMENT

STEEL
December 13, 1954

Metalworking Outlook

For Services Rendered

Union leaders want the Democrats to pay them for their support in the last election with revisions in the Taft-Hartley Act. But their services won't command payment that high. Many Democrats are not pro-union. Rep. Graham A. Barden (Dem., N.C.), who will be chairman of the House Labor Committee, advocates tougher T-H curbs on unions. So concerned is Labor about him that union men are pressuring House Speaker-Designate Sam Rayburn (Dem., Tex.) to load the committee with more amenable Democrats. Sen. Lister Hill, (Dem., Ala.), who will head the Senate Labor Committee, is somewhat pro-labor.

Pecking Away

The CIO electrical workers keep pecking away at the Communist-dominated United Electrical Workers. Their latest victory: Ousting the UE local at Westinghouse Electric Corp.'s Trenton, N. J., lamp plant. Now all Westinghouse lamp plants are CIO. It represents 66,000 in 27 local unions in the company.

A Look at the Books

Take a good, long look at the National Labor Relations Board's ruling involving Truitt Mfg. Co., Greensboro, N. C. The board says the company refused to bargain because it did not allow the union to examine its books. Labor wanted to check the company claim that it could not grant wage demands because of financial inability. If carried to its logical extremes, this ruling could mean that unions now have NLRB sanction to look at practically anybody's books. Few companies would be able to grant the full wage demands of unions and remain in competitive business.

Strike Losses Hit Low

This year will probably set a postwar low in man-days lost because of strikes. For the first ten months only 19.8 million were lost, compared to 24.8 million in the 1953 period, 56.7 million in 1952, 20.3 million in 1951. And 1955? Odds are that strike-induced idleness will rise because of serious disputes likely in the auto industry.

More Attractive Incentives?

The administration will recommend to the next Congress that incentives be made more attractive to develop domestic sources for critical materials. That's between the lines in the report of the President's Cabinet Committee on Minerals Policy. It recommends: A complete review of all stockpile objectives and establishment of new long-term goals; periodical evaluation of the supply-demand situation for metals and minerals on a case-by-case

basis; and review by interested government agencies of what's needed to build and maintain the mobilization base for metals and minerals.

"Net Worth" To Stay

The Internal Revenue Service's "net worth" theory is here to stay. The Supreme Court upheld it last week. It's customarily used to assess taxes against suspected evaders, but it's also employed to assess taxes where a taxpayer's records are inadequate to determine tax liability. Under the method, the government estimates net value of the taxpayer's assets at the start of a year, then proves increases in his net worth for each succeeding year under examination and levies taxes on that basis.

Follansbee Tangle

Last week 11 lawyers were trying to unravel the snarled sale of Follansbee Steel Corp., a deal that will probably go down in history as one of the most tangled of all time. Republic Steel Corp. withdrew completely from its part which was simply to buy some of the Follansbee equipment. Of the three or four parties still involved, Cyrus S. Eaton and associates last week appeared to have the best chance to end up with the property.

To Identify Metals

Electric Boat Division of General Dynamics Corp. is inquiring for equipment to mark metal products in its stockroom at Groton, Conn. It wants to avoid another such instance as that in which the steam piping system on the atomic submarine *Nautilus* failed because pipe not designed for such service was mistakenly used in the line. The Defense department continues to push for marking standards on steel and copper products.

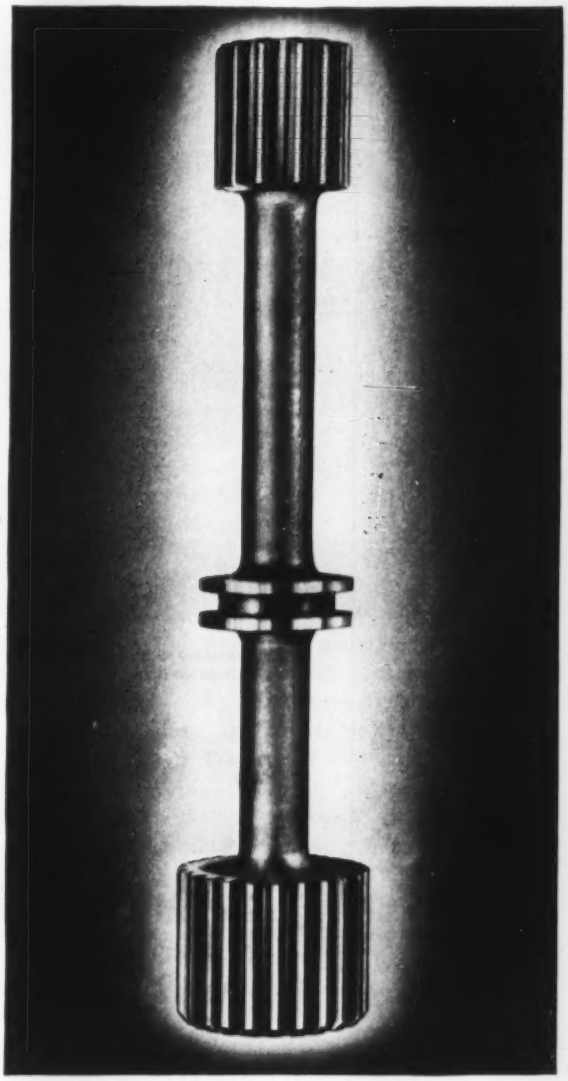
Straws in the Wind

Brussels has heated its whole Rue Neuve with infra-red radiation . . . Armed Forces procurement people will have to get Defense Secretary Charles E. Wilson's approval before buying tools and facilities if they'll cost $1 million or more . . . General Electric Co.'s Ralph J. Cordiner predicts that by 1976 atomic energy will be used to fuel half of all the electric generating plants then being built . . . A. M. Byers Co. will hold informal meetings with stockholders on Dec. 14 and 16 to talk over dissatisfaction with the company's management expressed by some shareowners . . . Duraloy Co., Scottdale, Pa., maker of alloy castings, has really diversified with purchase of three Florida hotels.

This Week in Metalworking

Aircraft suppliers can still fly high despite slightly lower sales volume for the aircraft industry next year (p. 57) . . . The cost of industrial relations services has jumped 11 per cent in the last year (p. 60) . . . Labor Secretary James P. Mitchell opened the administration's drive to get more labor support at the CIO convention with a speech condemning the right-to-work laws in 17 states (p. 60) . . . Heat treating jobbers and industrial furnace makers expect better business in 1955 (p. 61) . . . Economic conditions improve in France and Belgium (p. 68).

RESISTS FATIGUE 3 TIMES AS LONG AS RUNNER-UP IN TEST



Here's a case where Armco 17-4 PH Stainless Steel solved a fatigue problem in a vital hydraulic pump shaft for military aircraft use. Under accelerated fatigue tests the shaft made of Armco 17-4 PH lasted 30 hours. The next best metal in the identical test was a non-ferrous alloy. It lasted nine hours. Shafts of 4140 alloy steel and Type 440-C stainless steel lasted less than one hour.

Many other metals were tried but it took a special stainless steel, Armco 17-4 PH, to meet the mechanical requirements of rapidly changing loads, fast acceleration and deceleration.

WHAT ARMCO 17-4 PH OFFERS

Armco 17-4 PH is a precipitation-hardening stainless steel of good corrosion resistance. It can be fully hardened after fabrication by holding at 850 to 900 degrees F for 1 hour and air cooling.

Because of the low-hardening temperatures, Armco 17-4 PH can be finish-machined in the annealed condition without allowance for scaling or distortion in heat treatment. Machining speeds are the same as for Type 410 (BHN 280-320), while in the hardened condition, Armco 17-4 PH can be machined at 60 per cent of Type 410 speeds. In both cases, finish is excellent.

WRITE FOR INFORMATION

Armco 17-4 PH is produced in billets, bars and wire. Then too, there is the double heat-treatment precipitation-hardening grade known as Armco 17-7 PH. It is supplied in sheets, strip, plates, bars and wire. Write us for complete information on both of these grades.

ARMCO STEEL CORPORATION

4484 CURTIS STREET, MIDDLETOWN, OHIO

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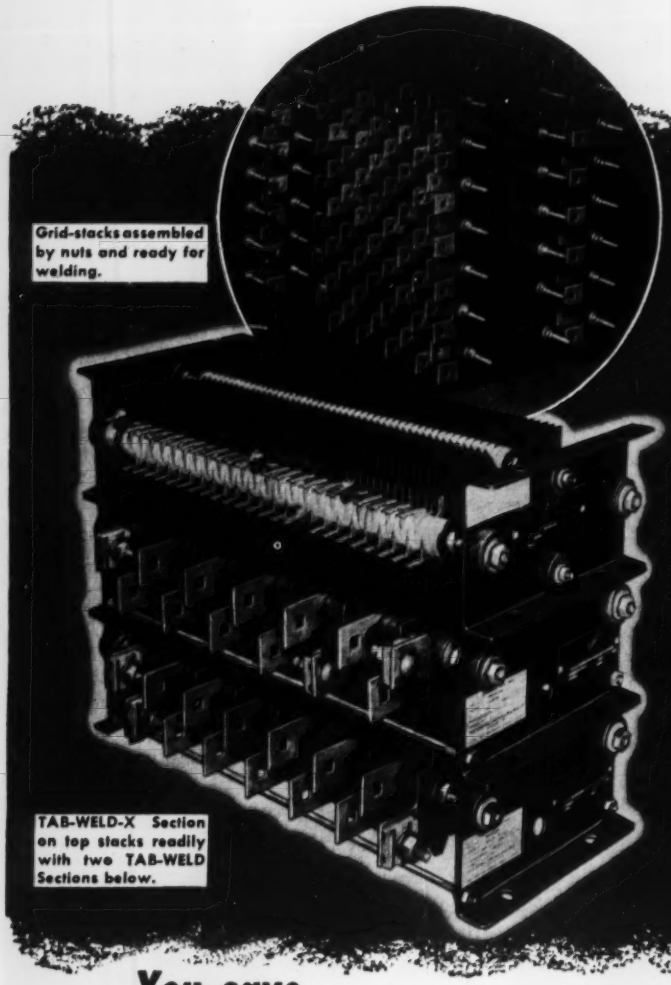


Grid-stacks assembled by nuts and ready for welding.

TAB-WELD-X Section on top stacks readily with two TAB-WELD Sections below.

clamped by nuts . . . then WELDED

Spot-welded to insure continuous current-path.

You save on UPKEEP with this added feature

EC&M TAB-WELD Plate Resistor Sections are assembled on rods to form the grid-stack like any other grid section. Clamping-nuts squeeze the grids into intimate contact internally before the end-frames are added.

Then, in these EC&M sections, the tab-ends of adjacent grids and tap-plates are *welded* to maintain intimate contact and to eliminate burning at the grid-eyes and at the tap-plates. This is an exclusive EC&M feature. Tests show that welding stabilizes the OHMIC value of the section, independent of clamping-nut pressure.

In addition, EC&M TAB-WELD Plate Resistors can be used without alteration, from the storeroom shelf. On-the-job connections are easily made to any of the tap-plates . . . small adjustments in resistance-value readily available by moving only the external-lead and terminal-block.

SPECIFY

EC&M BULLETIN

942

WELDED PLATE RESISTORS

THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET ★ CLEVELAND 4, OHIO

Do-It-Yourself Management

We have just read several hundred comments by metalworking executives who contributed to STEEL's annual survey of business expectations. We are deeply impressed by what they say will influence their business over the next twelve months.

In earlier postwar surveys, the majority of comments: 1. Damned the national administration. 2. Cited the ruinous effects of unfair and burdensome taxes. 3. Decried rising costs, particularly the heavy demands by labor. In those days, management men were mostly concerned over situations external to their business and over which they had little or no direct control.

This year's comments are different. They say, in effect: How we do in 1955 will depend on the intelligence and effort we put into the management of our business.

They plan to utilize new materials, new machinery and new processes. They are looking at the free machining metals to speed production, reduce tool wear and eliminate secondary machining. Tailor-made alloys, to give more precisely the properties required by the product, are receiving close attention. Modern heat-treating methods are being employed to bring out the plus values of metals. All along the technological lines efforts are being redoubled to develop cost-reducing innovations and better techniques to raise the output per unit of human effort and per dollar of investment.

They talk about making better products at lower cost, about developing new products, about tapping new markets and broadening present ones.

They are preparing for harder selling, better service to their customers, more aggressive marketing research.

They are reviewing their management organizations. Overhead costs are being reduced by revamping the structure and by adopting better systems.

They recognize that we again are in a strongly competitive, though expanding economy. They are meeting the challenge of competition squarely.

They are focusing their attention on internal management problems over which they have a great deal of control.

That is why they and we are optimistic over prospects for the months and years ahead. That explains their and our confidence in the strength of American industry.

Walter J. Campbell

MANAGING EDITOR

THE DU PONT CASE: All signs hint that Democratic congressmen will try to make political hay in the 84th Congress by investigating the merger trend. Sen. Estes Kefauver, Rep. Emanuel Celler and Rep. Wright Patman in particular will charge that it and other prac-

tices indicate that our economy is infested with monopoly (p. 64).

Without question there have been companies guilty of promoting monopoly. We and every right-thinking man in industry condemn them. But just because a company merges with another, and the resulting organization is big, constitutes no grounds for condemnation, per se. Yet, a study of Roosevelt and Truman antitrust suits reveals that the brunt of the attack was against big, complex and successful companies. A case in point is the antitrust suit filed five years ago under the Truman regime against E. I. du Pont de Nemours & Co., U. S. Rubber Co., General Motors Corp. and the Du Pont family.

Federal Judge Walter J. La Buy has just dismissed the case, saying: "The government has failed to prove conspiracy, monopolization, a restraint of trade or any reasonable probability of a restraint." While the government may appeal the decision, the case as it now stands is a major victory for the defendants. But at what a cost! Hotel bills for defense attorneys alone amounted to $750,000. No wonder some defendants in other cases have signed consent decrees rather than pay such a price.

Let's weed out monopoly. Let's weed out, too, the politicking that parades under the banner of monopoly-fighting.

NAM AND EDUCATION: The National Association of Manufacturers is continuing and strengthening its campaign to win more corporate support of our educational system.

NAM urges aid for all education but points out that the greatest financial help is needed for private colleges and universities. In fact, $250 million a year will be needed for a five-year period to bring the private institutions up to date. It urges a regular company policy of giving.

Many firms are already doing an enlightened job of financial donating. Corporations gave about $250 million in 1950 and $343 million in 1951 for all purposes. Of those sums, the educational system got $50 million in 1950, $60 million in 1951.

INDUSTRY AND EDUCATION: One of the trends of the times is the new emphasis on industrial self-education. Popular now are the small, private shows to give special information to industry, Behr-Manning Corp. just had one on coated abrasive finishing (p. 62).

Even more popular is education in management subjects. Organizations such as American Management Association have meetings and seminars on a whole gamut of management matters. Even individual companies sponsor seminars on the subject. Eastern Brass & Copper Co. Inc. just had one on management for small business (p. 62).

A third type is education of the public by industry. General Motors Corp.'s Motorama comes under that heading. So does a permanent exhibit just opened in New York by Worthington Corp. It expains basic physical and scientific principles, showing how they work in industrial and domestic applications.

Of course, such endeavors are at least partly motivated for business reasons. But they are examples of enlightened self-interest and prove that industry is maturing.

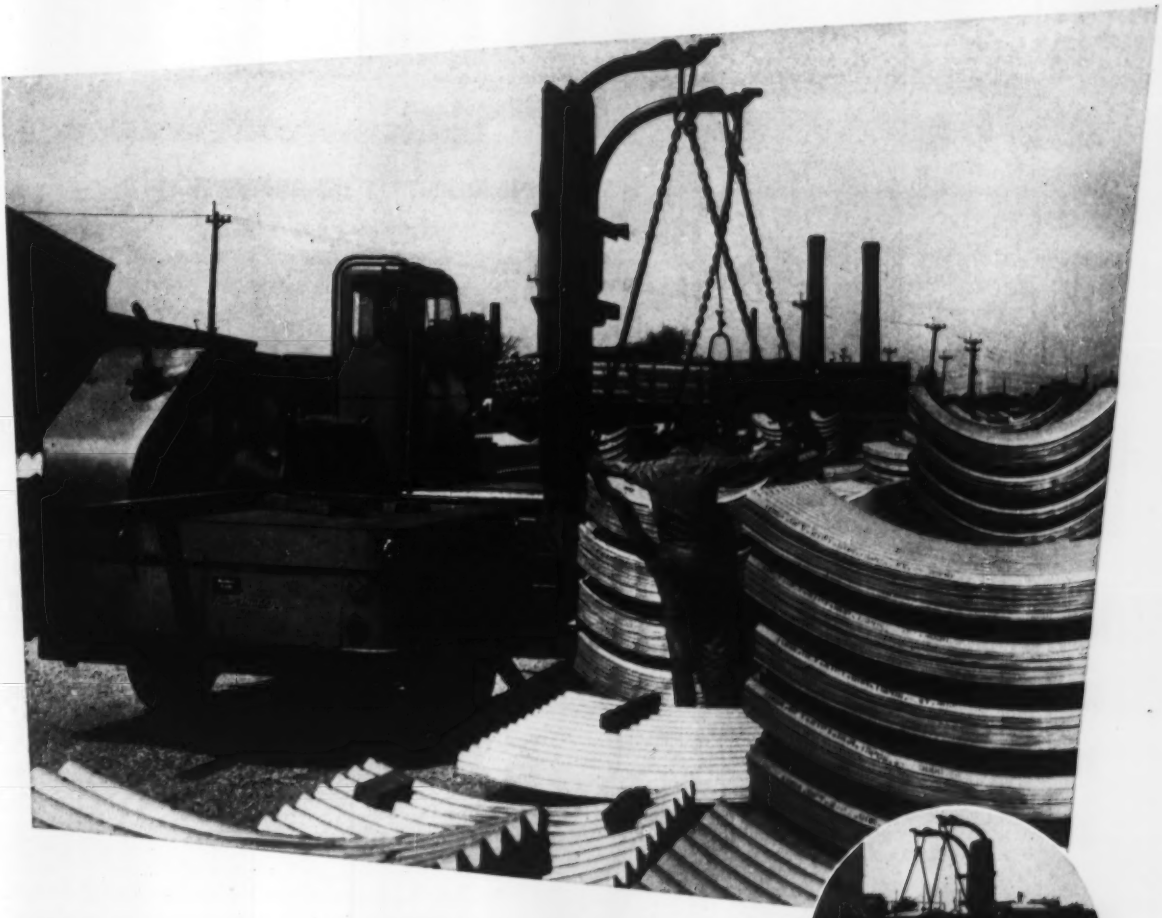
FLYING HIGH: The aircraft supplier's life is not always a happy one. Not only does he have to meet the usual economic problems that we all face but his business is also dependent to an unusual degree on the vagaries of international politics.

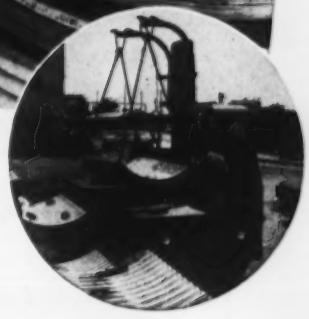
Right now, aircraft subcontracting is declining (p. 57). As world tension eases slightly, aircraft sales drop. But the expected $8.2-billion volume next year for the airframe, engine, propeller and other members of the industry will still mean big business for subcontractors.

AIRING A PROBLEM: Wandering around a modern plant, you easily get the feeling that the triumvirate of electric, hydraulic and air power is taken for granted. It's a feeling compressed air equipment manufacturers would like to do something about.

All too frequently they face the situation of a plant with insufficient air power to meet mushrooming needs. When the cause is inadequate compressor size, it's an easy one to solve. But when the air distribution system is inadequate, the real headaches begin.

Install a big enough distribution system in the beginning to handle future air demands is the lesson. There's a simple way of figuring just how big (p. 100).





SIDE-LOADING *Traveloader* DOES A JOB HERE NO OTHER HANDLING MACHINE CAN DO

Traveloader easily picks up long, awkward loads from the side and carries them securely and speedily to near or distant points—without changing travel direction. This unusual feature enabled a large mid-western steel company to set up a highly efficient system for handling and yard-storing heavy curved corrugated steel plate sections.

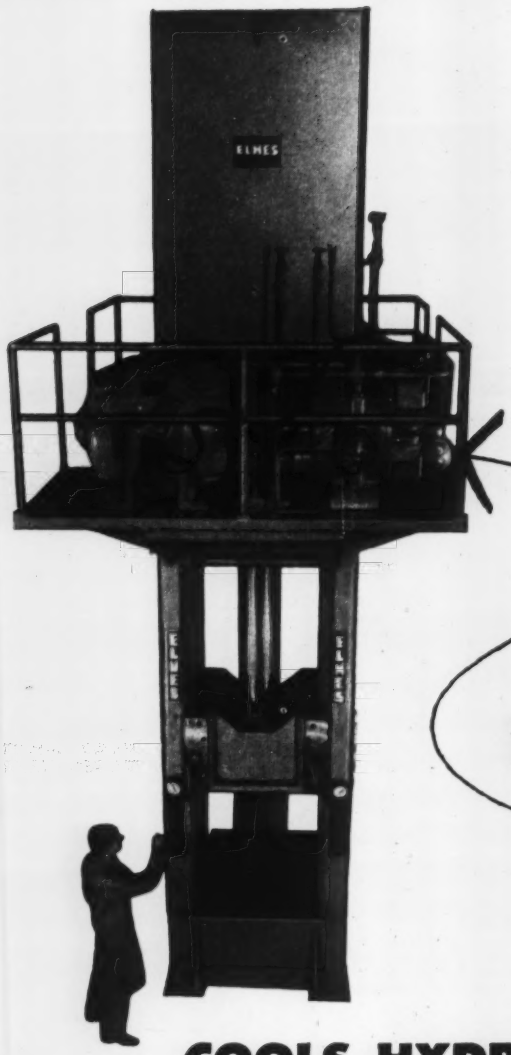
Unit loads weighing up to 9,000 pounds are placed on the Traveloader by overhead crane at the fabricating department, transported to storage area and tiered along 12-foot aisles. As needed, sections are picked up by the Traveloader and delivered to the shipping platform. A special attachment permits handling of single sections or "split lifts."

As a direct result of this method the company uses yard space to much better advantage, fills orders faster and substantially reduces handling manpower.

The Traveloader also handles pipe, lumber, loads weighing over 4,000 pounds and any awkward loads. It does yard maintenance work, positions machinery and performs many other handling jobs not practical or possible with any other equipment.

Write for Bulletin 1360. It completely describes the remarkable TRAVELOADER that carries like a straddle truck, delivers like a road truck, and stacks like a fork truck. The Baker-Raulang Company, 1259 West 80th Street, Cleveland 2, Ohio.

Baker.
industrial trucks



ROSS EXCHANGER

COOLS HYDRAULIC OIL

to keep this 200-ton Elmes Drawing Press operating at peak efficiency

Neatly mounted at the crown of this 200-ton Elmes Drawing Press, a compact Ross Type BCF Exchanger plays an important role. It maintains correct hydraulic oil temperature. Pump slippage from overheated, thinned oil is prevented. Peak press efficiency is thereby insured for all types of deep drawing and forming operations.

"Ross Coolers are used extensively on Elmes Hydraulic Presses. They are chosen for their high efficiency, compactness and ease of installation. We find they stand up well under pressure surges and require no upkeep," reports Elmes Engineering Division, American Steel Foundries.

Favored for numerous types and makes of hydraulic machinery, rugged Ross Type BCF Exchangers are pre-engineered, fully standardized and stocked in a wide range of sizes to meet most needs . . . promptly.

For more information, request Bulletin 1.1K5.

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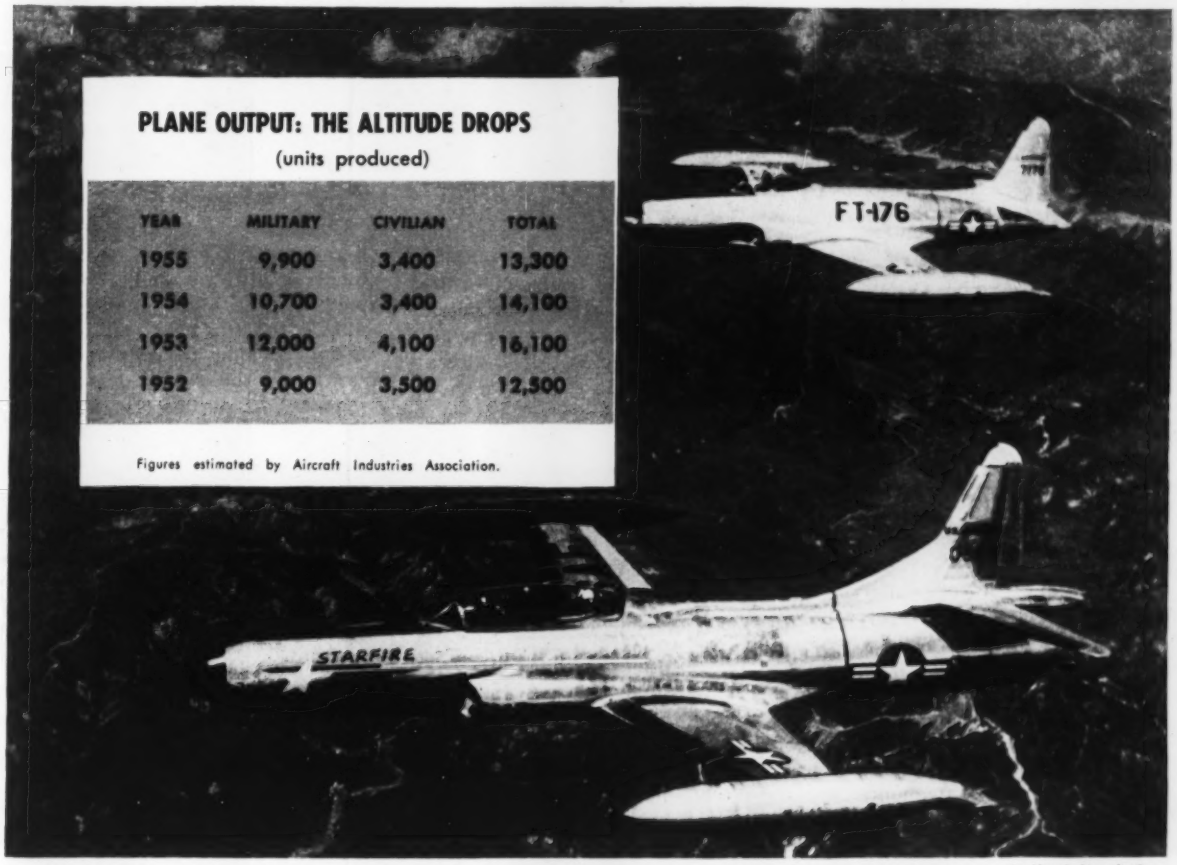


PLANE OUTPUT: THE ALTITUDE DROPS

(units produced)

YEAR	MILITARY	CIVILIAN	TOTAL
1955	9,900	3,400	13,300
1954	10,700	3,400	14,100
1953	12,000	4,100	16,100
1952	9,000	3,500	12,500

Figures estimated by Aircraft Industries Association.

Lockheed Aircraft Corp.

Aircraft Suppliers Still Flying High

MORE THAN 4000 subcontractors supply a major aircraft engine manufacturer with the 8854 parts that go into a new jet engine.

An estimated 50,000 subcontractors and suppliers—more than half are in metalworking—support makers of airframes, engines, propellers and other aircraft equipment.

A Big Chunk—Much of next year's expected sales volume in the aircraft industry will find its way to those 50,000 suppliers. But they'll probably receive a moderately lower income from aircraft next year than in 1954. Two reasons explain that: Aircraft producers are subcontracting a little less, and their total volume will be off—expected to be $8.2 billion in 1955 against an estimated $8.6 billion in 1954 and $8.5 billion in 1953.

But the subcontracting opportunities are still bright, particularly for electronics parts. The Air Force says that about 60 per cent of the total cost of a bomber model and 75 per cent of the total cost of a particular missile were for electronic equipment. While those examples are above average, all aircraft and missiles rely heavily on electronics.

Where Dollars Go—Electronics are a substantial part of the $5.2 billion sales estimated by Aircraft Industries Association for airframe manufacturers this year. That figure does not include the cost of any government-furnished property. As a major portion of the electronics equipment on modern planes is supplied by the government, opportunities for subcontracting are even higher than the $5.2-billion sales indicated.

The second most important opportunity for subcontracting is in engine parts. AIA estimates sales by engine manufacturers in 1954 will hit $2.2 billion. Some $800 million will be spent this year on other products and services for the aircraft industry, which offer additional opportunities for subcontracting. A fourth part of the industry — propeller production which will this year be worth $400 million—probably offers the least opportunities for suppliers.

Subcontracting Geography — The prime aircraft contractors are most likely to be in Southern California. The Los Angeles area

has the largest concentration of aircraft production facilities in the U. S., accounting for about 22 per cent of the national total of employment in the aircraft and parts industry. An additional 4.5 per cent is in the San Diego area, giving Southern California about 26.5 per cent of the national total.

There are 28 different firms buiding complete airframes. Average aircraft employment for the year will be about 810,000, about 580,000 are production workers. Employment has been sliding since last January, when it was 830,000, of whom 602,000 were hourly employees.

Leveling Off—Adm. DeWitt C. Ramsey, AIA president, believes several factors will tend to keep the aircraft labor force from declining much more. "Among them is the fact that mounting weight and complexity of modern supersonic military planes require more man-hours per plane. Also, the industry is expected to devote more effort and time toward guided missile development and production."

He says that production today is "slightly less than 900 military planes per month," down from a peak of about 1000 planes per month reached last year. He adds that the decline will continue to a level "adequate to maintain full modernization of the planned U. S. military air strength."

The Target — Those strength goals—a 137-wing Air Force and commensurate Naval aviation—are scheduled to be achieved in mid-1957. Then, our military services are expected to have an active inventory of about 40,000 planes, more than half of which will be jet-powered. America's aircraft industry has built more than 35,000 military planes since the outbreak of the Korean War.

Some 10,700 of those military planes (see table) will be built this year; slightly less than 10,000 will be in 1955. Of the estimated 3400 units to be built this year for civil use, 325 will be transports and the balance utility types. Prospects for civil production are about the same for 1955, too. Although unit production of utility aircraft declined by about 750 units from the 1953 level, airframe weight increased by about 1.8 million lb.

Exports—The U. S. has been supplying about $800 million worth of aeronautical equipment a year to friendly nations since 1952. That's expected to continue in 1955. About 900 or 950 civil aircraft were exported this year, some 250 of which were used or surplus craft. Exports of civilian planes will be about the same next year.

The aircraft industry's altitude next year will be a little lower than this year. But it will still be high. Those aircraft subcontractors and suppliers who navigate skillfully can go as far on aircraft business in 1955 as at anytime in their history.

ODM Allows Higher Bids

Companies vital to the nation's industrial mobilization capacity can be awarded contracts by the military even though they are not low bidders, says the Office of Defense Mobilization.

This action reverses an ODM ruling which read: "The general policy where such suppliers are unable to compete successfully on a bid basis shall be to re-examine the mobilization base to determine if the capacity can be maintained without inclusion of high-cost producers."

The government desires to keep the number of companies making up the "mobilization base" as large as possible. It feels that its original policy statement could have been interpreted by military procurement officials as restricting defense work to low bidders.

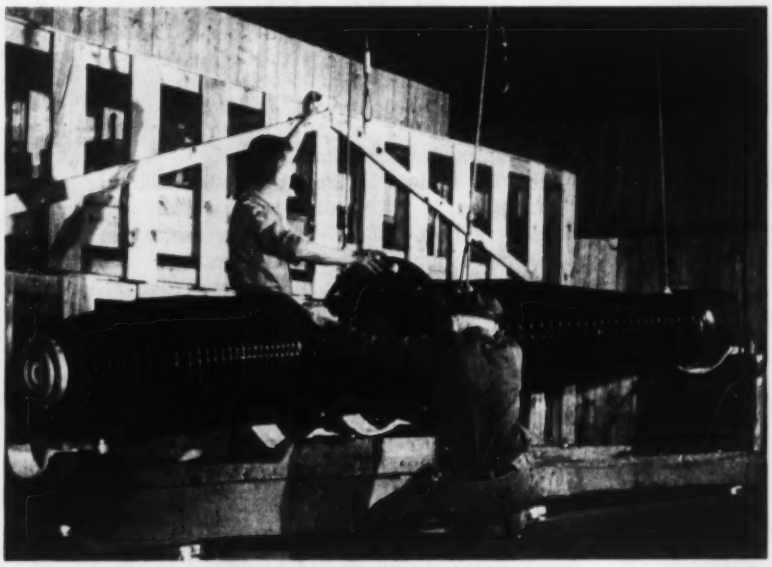
Steel Payrolls at Peak

Highest payroll since March is reported for the iron and steel industry in October. And, says American Iron & Steel Institute, the $244.7 million paid out in that month brought payrolls in the industry to the second highest 10-month total in history. Only the like 1953 period saw more cash in the pockets of steel workers.

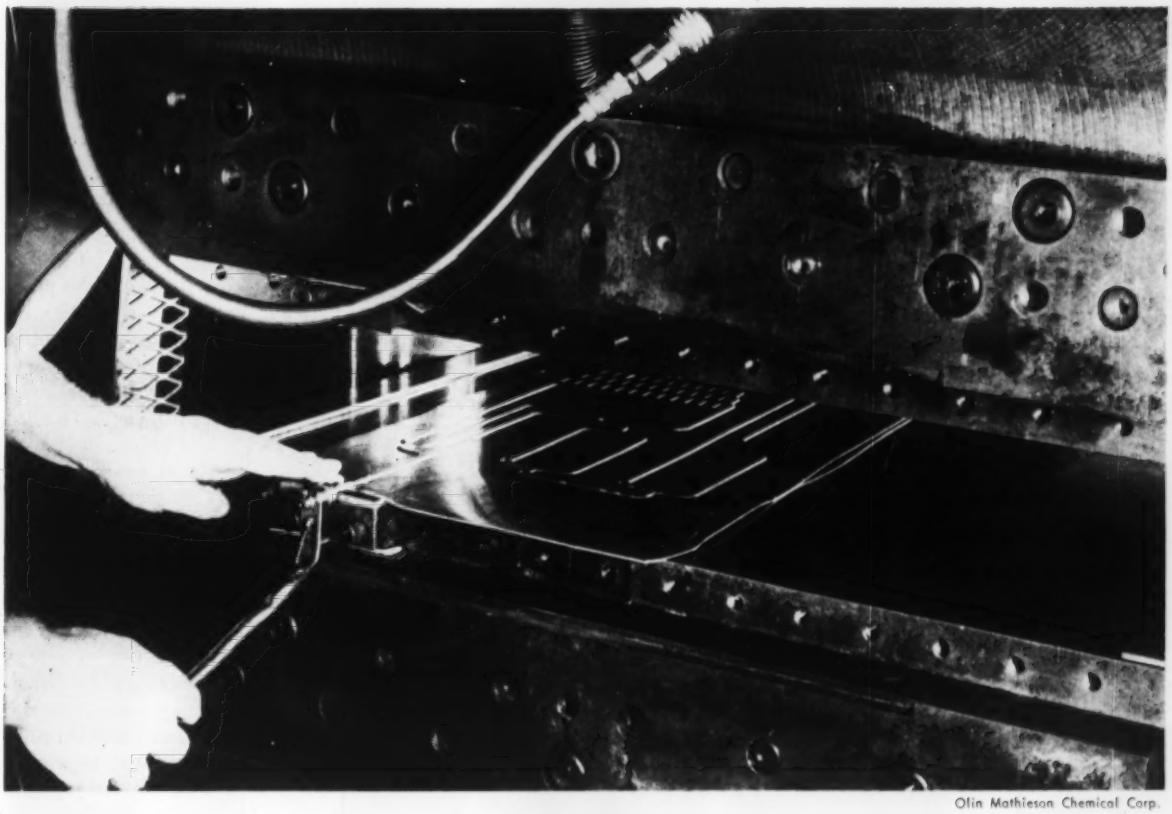
One reason for the payroll jump in October: The average wage earner worked 36.6 hours a week, compared with 35.7 hours in September and even less before that.

On the not-so-bright side, employment in the industry continued to fall. Most of those cut apparently were salaried help. Hourly workers may have shown a small net gain for the month.

November figures should show a further gain in wages and hours worked. There is some chance, too, that employment is on the way back up.



General Electric Co.'s Power Transformer department, Pittsfield, Mass., has developed a new method of crating large porcelain bushings for high-voltage apparatus. Blocks of wood in the package are scrolled to the contour of the bushing and lined with felt-like material. Rubber shock mounts are bolted to the skids of the crate which is used for bushings weighing from 200 to 6000 lb



Olin Mathieson Chemical Corp.

After Olin Mathieson produced more than 250,000 units on a pilot basis . . .

Frigidaire Goes All Out for Roll Bonding

FRIGIDAIRE DIVISION of General Motors Corp. may begin saving a sizable amount of money by using roll bonded evaporator plates for all its 1955 model refrigerators and freezers.

Roll bonding of evaporator plates—an idea originated by Lee Grinnell, now with Frigidaire, and developed by Olin Mathieson Chemical Corp.—is a new twist on an old process.

How It's Done—Sheets of metal are joined by being rolled through mills under heat and pressure. A "stop-weld" material applied to the sheet metal by the silk screen process prevents the tubing areas from being joined. This pattern is later expanded into tubes by hydraulic pressure.

At Frigidaire the brass evaporator plates, such as are now commonly used, require about nine different dies. They alone represent between $40,000 and $60,000. With the new roll bond process, the pattern for the silk screen process costs somewhere between $40 and $60.

Adds Up—Of course, there are a couple tools required for Frigidaire's roll bonded evaporator plates for such things as notching, piercing and flanging, but the tool savings on one model evaporator plate can still exceed $25,000. There is also a reduction in work hazards as the present method of brazing requires work close to the melting point of components.

Add the fact that most of Frigidaire's evaporator plates are changed each year in some degree to accommodate style changes or incorporate new features, and the roll bonded evaporator plate looms as a significant money saver for Frigidaire and other appliance-makers. Huntley Campbell, general manager, Olin Mathieson's Metals Division, foresees the new development as the forerunner of a new multimillion-dollar industry.

Whether the new aluminum evaporator plates are used in all 1955 Frigidaire refrigerators and freezers depends on the supply from Frigidaire's suppliers. Though there are more than 250,000 of the new units already in use in the U. S., production up to now has been on a pilot plant basis. The immediate question is whether its suppliers can increase their output enough to fill Frigidaire's needs for this year.

Aluminum Pipe Saves Time

Aluminum pipe is being used in Texas to service companies wanting temporary oil, gas and water lines. Considerable savings are reported in man-hours and installation time. Three men with one truck have laid a mile of 2⅞ in. aluminum pipe in 3 hours.

The pipe was made by Reynolds Metals Co.

'Extras' Cost More in '54

This year's bill for employee benefits is up 13 per cent. Increased expenditures for health and safety are one big reason

AMERICAN BUSINESS is continuing to invest more and more in personnel and industrial relations programs, reports Dr. Dale Yoder, of the University of Minnesota's Industrial Relations Center.

A national survey by the American Management Association indicates the average cost of providing each employee industrial relations staff services has increased 13 per cent from last year to a new high of $69.34.

Health and Safety Cost—Growing expenditures for health and safety are the reason for a large part of this increase. Average costs here are about 50 per cent higher than last year's. Manufacturing industries are ranked high above the national average for such expenditures, and the sharp rise can be directly traced to them.

Funds administered in 1954 by personnel departments but actually outside their control—such as sums paid for employee benefits, insurance and retirement—averaged $151.35 per employee, almost twice the total of staff costs. Here there is a wide variation among industries, with an average of $121.4 in manufacturing, $83.19 in banking and $604.16 in public utilities.

"Fringe Benefits" — Median amounts are $168.75 for employee services, $21 for medical, health and safety, $2.25 for labor relations and $6.25 for training. In addition, an average of $2.50 is held in the overhead and miscellaneous category.

Purposes for which these funds are used include subsidies for cafeteria and food services, wages and salaries of trainees, memberships in nonprofessional associations, insurance, hospitalization and pension premiums, holiday and vacation pay, unemployment compensation taxes, contributions to employee savings plans and pay for time off for jury duty, for military training and to attend funerals.

What Industrial Relations Staff Services Cost

(per employee)

1954	$69.34
1953	61.26
1952	48.59

Mild Meeting for CIO

Year of limited gains in 1954. Hottest issue concerns CIO-AFL merger

HURDLES barring a merger of the CIO and AFL seemed to get higher at the CIO convention in Los Angeles last week. But it's still likely a merger will take place —eventually.

CIO President Walter P. Reuther said he was ready to do "everything possible" to consummate the alliance, but that it must be worked out on a "sound" basis.

Point Four—That basis includes four principles enunciated earlier by Mr. Reuther: All units of each organization must bind themselves by the principles contained in present no-raiding-for-membership agreements; the principle of industry-wide organization must be protected in future efforts to organize such industries as chemicals; racial discrimination must be eliminated; and power must be vested in the central organization to clean out corrupt elements where individual unions fail to do so.

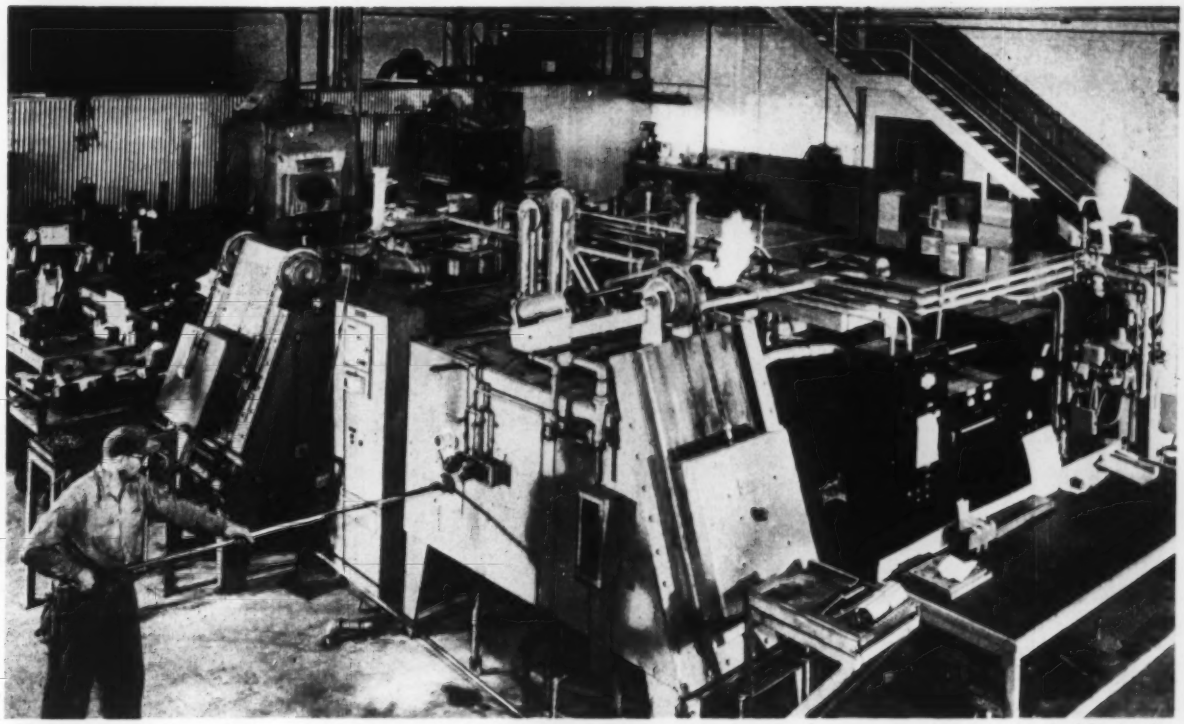
It's the first and last points which may prove obstacles for some time. George Meany's AFL federation is so loosely constructed that the central group has little means to force their acceptance. The points have met with only limited acceptance thus far.

Pro and Con—But men close to CIO affairs say it really has little choice but to keep on angling toward a merger as long as the steelworkers' union threatens withdrawal.

So it was no surprise when a decision directing CIO officers to work out a merger with the AFL was approved by the convention.

Also Called—Automation came in for its share of blame for present unemployment. The advantages of automation can be called a blessing only if those rewards are shared among the various economic groups in the country, said Mr. Reuther.

In the administration's first strong bid to woo support of labor for the Republicans, Secretary of Labor James P. Mitchell defended the idea of compulsory union membership and condemned state right-to-work laws.



Lindberg Steel Treating Co.

New processes, materials, equipment spell . . .

More Furnaces, Heat Treating in 1955

BETTER BUSINESS in 1955 is forecast for the heat treating industry. Commercial heat treaters' billings in the first half of 1954 were off about 25 per cent from 1953's first half, but "some of the loss was recovered in fourth quarter and a steady increase is expected during 1955," says C. M. Cook, president of Metal Treating Institute.

That prediction makes even stronger the outlook for industrial heating equipment as viewed by Carl L. Ipsen, executive vice president of the Industrial Heating Equipment Manufacturers Association. He sees the association's index for 1955 rising to 169 (1945-1947=100). That's up 6 points from 1954's 163, but little over half of the Korean War peak of 331. Still, Mr. Ipsen views even 1954 as "a reasonably good one for IHEMA members."

Modernization—Prime mover in creating new business, he says, is the need for many plants to modernize heat treating equipment. Since obsolescence of equipment is faster than replacement, no drop in business is expected.

In anticipating more business for commercial heat treaters, Mr. Cook of MTI, who's also president of Cook Metal Treating Co. of Texas, Houston, says many firms who operated their own heat treating facilities are reviewing uneconomical operations and are contracting for outside services to get greater economy without sacrificing quality.

Competition — On the other hand, he points out, some manufacturers with excess heat treating capacity are jobbing it out.

On the optimistic side, he says metal treating is continually expanding with new processes, materials and equipment. Looked to as business boosters are hard surfacing treatments for aluminum, new coatings for iron and steel, development of new, more heat treatable titanium alloys, greater demand for controlled atmospheres and faster processing equipment.

Order Builders—Technical advances in 1954 that should bring business to furnace builders in 1955 are:

Refinements that make possible automatic control of furnace atmospheres.

More automation.

Production size vacuum melting furnaces.

Induction heating of billets for forgings by the use of dual frequencies.

METAL TREATING BILLINGS

1954	$25,250,000*
1953	31,733,067
1952	30,875,924
1951	24,930,000
1950	12,740,000
1949	8,790,000
1948	10,830,000

Source: Metal Treating Institute.
*Estimated by STEEL.

Visitors stop, look and listen, as . . .

Coated Abrasives Strut in Show

WITH HARD SELL the order of the day, take a look at a special sales tool, the private, small show.

When a limited number of products are on display and a select group of visitors examine them, the smaller shows often are worth their weight in business.

Switch — Behr-Manning Corp., Troy, N. Y., took a look at the small show—and altered the pattern slightly. Instead of showing off its line of coated-abrasive products, it decided to sell the whole process of coated abrasive finishing. Reason: As the process goes, so goes Behr-Manning.

Its show, the Metal Finishing Show and Conference, was held in its Chicago warehouse. Some 34 equipment makers displayed 72 coated-abrasive-using machines. The machines were set up to run, some of them on customer jobs.

Two Ways—Besides focusing attention on their industry within an industry, the sponsors and the participants took the chance to do consulting work with visitors. Some problem jobs were solved on the spot.

A post-show check shows that at least 90 per cent of the 2000 visitors had specific production problems in mind. To help them get the right answers, the experts from B-M and from the machine builders set up 77 clinic meetings.

Figure and Try—In the meetings, the problems were discussed and proposals and counterproposals made. When the ideas of the experts had jelled into a pattern, many of the jobs were taken out onto the show floor where sample parts were run on one or more machines for proof.

Variety — Machines on display ran the gamut from a giant microfinisher for prepolishing steel strip before forming, down to the myriad of small hand tools used in the home, the small shop or the big plant.

Problems tossed at the experts included those of contoured contact wheels and how to use them, belt tracking, recommended speeds and feeds and grinding on a wide variety of materials.

Confident that the show was both helpful and well received, Behr-Manning may conduct similar events in other cities.

School for Small Business

A mass of new knowledge exists for small businessmen. Eastern Brass helps them get it

ABOUT 800 small businessmen recently took a privately-sponsored extension course on how to be better managers.

They attended Eastern Brass & Copper Co. Inc.'s "Guidepost" seminar, Nov. 30-Dec. 2, at the company's Bronx, N. Y., plant.

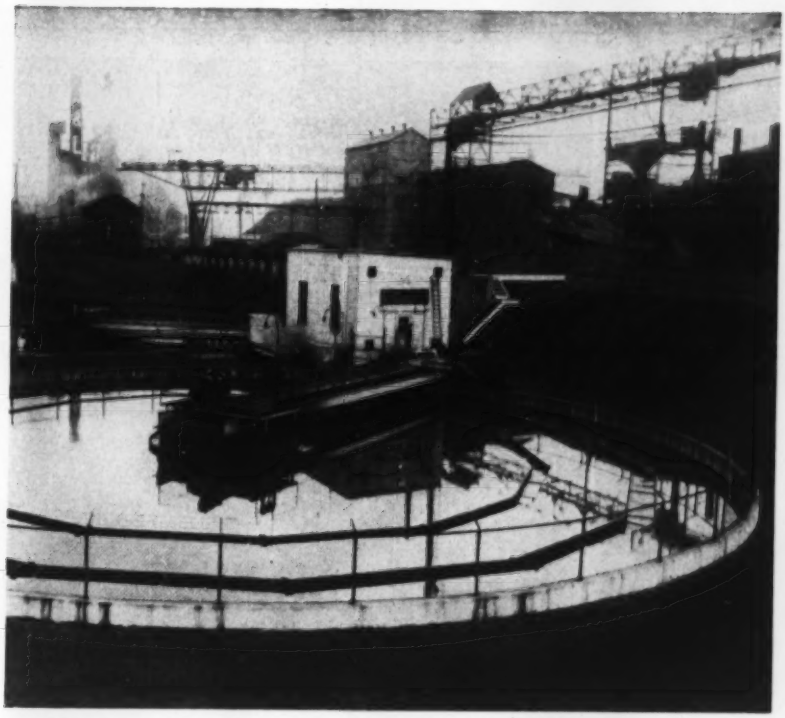
Loaded—Twin purposes of the meetings were to load the managerial guns of "average businessmen" with the latest techniques and give the small businessmen a look at recent trends in the economy from small business' point of view. Sixteen speakers made up the panels. Subjects ranged from "Sales" and "Purchasing" to "Credit and Taxation for Small Business."

Wendell B. Barnes, Small Business Administration administrator, told the group that this education in the problems of business is of prime importance since "lack of managerial ability" and "lack of experience" accounted for 89.4 per cent of all business failures reported by Dun & Bradstreet last year.

Other Interests — Besides helping small business get competent management counsel, Mr. Barnes continued, SBA's functions include helping it get access to adequate credit and obtain a fair share of government contracts.

SBA's record in those matters is good, said Mr. Barnes. "As of Nov. 15, we (SBA) have approved 987 business loans for a total of $53,676,154." As for government contracts, small business' share has risen to better than 20 per cent during the past year. That compares with 35 per cent during the war years and a postwar low of 16 per cent.

Way To Do It — "Under our Joint Determination Program," said Mr. Barnes, "we have been able to get bids with an estimated value of $328,870,656 earmarked exclusively for small business in one year's time. This is in spite of heavy cutbacks and cancellations in military purchases and orders."



Ore dust recovery unit at J & L's Aliquippa plant

States Clean Up on Ohio River

Good progress is indicated in the sixth annual report of the Ohio River Valley Sanitation Commission. With industry's help, more will be done

STATUS OF INDUSTRIAL WASTE-CONTROL FACILITIES

for industries discharging wastes directly to streams

	ILL.	IND.	KY.	N.Y.	OHIO	PA.	VA.	W.VA.	TOTAL	% OF TOTAL
Treatment or control provided, facilities adequate	8	120	70	0	43	71	9	40	361	30.3
Treatment or control provided, facilities inadequate	2	44	44	19	136	13	0	35	293	24.6
Treatment or control provided, adequacy of facilities unknown	2	4	26	5	21	36	5	37	136	11.5
Control facilities inadequate, improvements under construction	0	0	2	0	1	1	0	0	4	0.3
New treatment or control facilities under construction	0	4	0	0	2	20	0	6	32	2.7
Plans for treatment or control facilities completed	0	2	0	0	2	10	0	1	15	1.3
Plans for treatment or control facilities in progress	0	11	3	0	5	82	1	12	114	9.5
Need for treatment or control facilities undetermined	0	11	0	1	3	25	7	57	104	8.8
Order for treatment or control issued by state	0	0	0	0	0	18	0	0	18	1.5
No action taken by company	0	3	0	2	0	7	10	91	113	9.5
Total number of industries reported	12	199	145	27	213	283	32	279	1190	100.0

ALTHOUGH THEY GOT together six years ago, it's still news when eight states team up on a common problem: Water pollution in the Ohio river valley. Their sixth annual report puts them in the headlines again.

The eight states are Illinois, Indiana, Kentucky, New York, Ohio, Pennsylvania, Virginia and West Virginia. Their Ohio River Valley Sanitation Commission observes: "During 1954 alone, the percentage increase in population served by treatment works was as great as that secured during the entire eight years prior to our compact."

Industry Joins In—The report shows there's still lots to be done. An analysis of industry contributions to the effort (see table) shows that of the 1190 concerns discharging wastes directly into the district's waterways, only 361 presently have adequate treatment facilities.

Koppers Co., Jones & Laughlin Steel Corp., Crucible Steel Co. of America and Weirton Steel Co. are just a few of the many who have installed pollution control facilities and are contributing personnel and capital to organizational work and research.

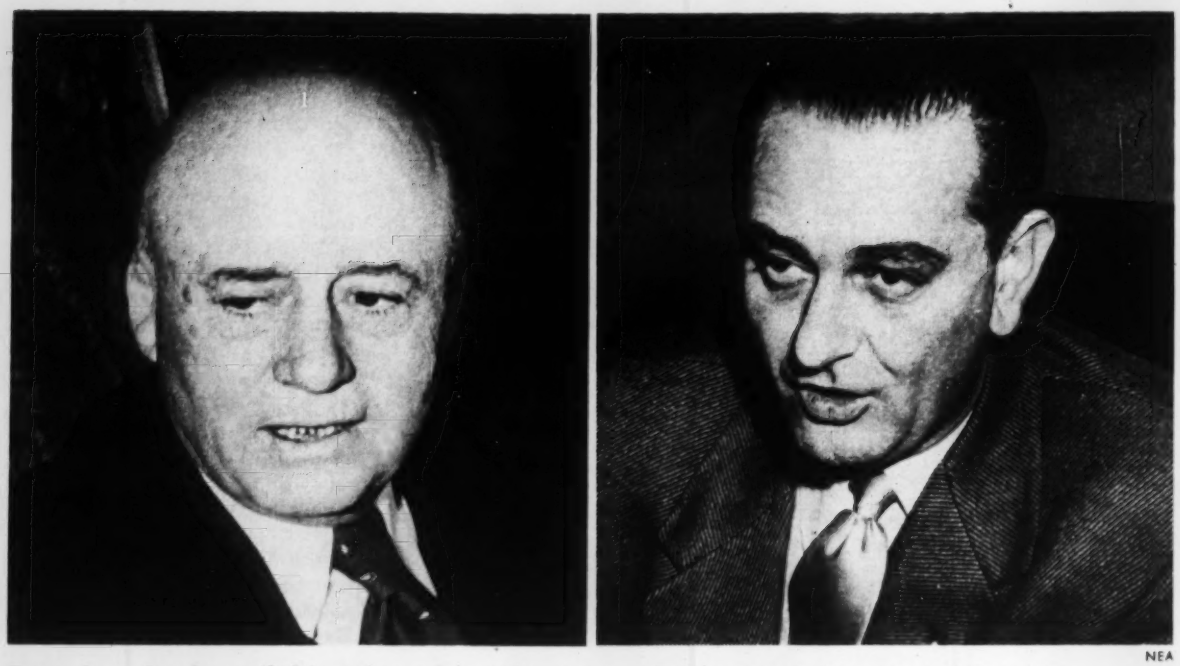
Seven industrial committees have been organized to advise the central commission. One of these, the Steel Committee, has many different projects under way. Phenol contamination, ferrous iron oxidation and removal of flue dust and solids are all being studied.

Metal finishing, oil refining, chemical process, coal, distillery and pulp and paper industries are also represented by committees.

More Research—Financed by the American Iron & Steel Institute, a literature review is being made, and the Mellon Institute is researching the problems of the effects of steel wastes on subsequent water uses. Financial support is also being provided for the central commission's toxicity evaluation project at the Kettering Laboratory.

Edward J. Cleary, executive director and chief engineer of the commission, sums up the present situation in concluding the report: "Any satisfaction with what has been accomplished must be tempered with sober reflection on the magnitude and complexity of the tasks that lie ahead."

By E. C. KREUTZBERG Washington Editor



NEA

From Sam Rayburn (left) and Lyndon Johnson, top Democrats in House and Senate . . .

50-50 Support in Congress for President

PRESIDENT EISENHOWER should not do too badly with a Democratic-controlled 84th Congress.

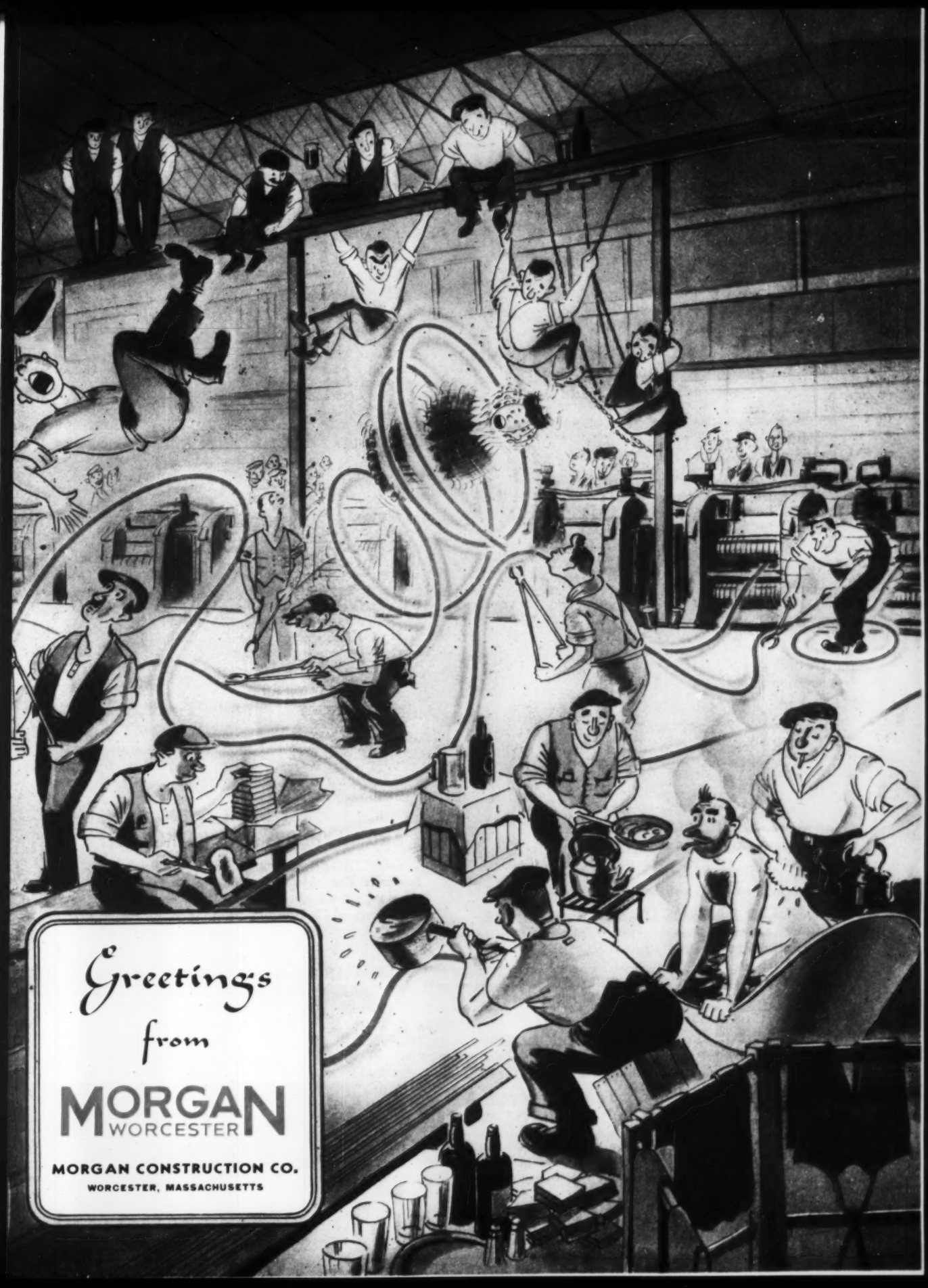
The accompanying table indicates that Democratic leaders in key congressional posts are split about 50-50 in support of his policies.

A Break—The White House is particularly fortunate to have Howard W. Smith (Dem., Va.) as chairman of the House Rules Committee. Strongly opposed to New Deal and Fair Deal policies, he will have a powerful voice in determining what legislation will be taken up on the House floor.

The Republicans and industry will have plenty of trouble with Rep. Emanuel Celler (Dem., N. Y.), Rep. Wright Patman (Dem., Tex.) and Sen. Estes Kefauver (Dem., Tenn.). They hope to stir up excitement through an investigation of monopoly and of what they term the biggest merger trend in our history. Much of what congressmen do in the 84th Congress will be with an eye to 1956 elections. So this next Congress promises to see a lot of sound and fury, but not so much legislative action.

How well will new Democratic leaders in Congress co-operate with Ike?

ARMED SERVICE UNIT HEADS: Sen. Richard B. Russell (Ga.) Rep. Carl Vinson (Ga.)	Both are well acquainted with the country's military needs and are disposed to work with the White House.
INTERIOR COMMITTEE CHAIRMEN: Sen. James E. Murray (Mont.) Rep. Clair Engle (Calif.)	The President can expect trouble with these men. Both think the U. S. should pay for reclamation and favor a giant program in the West. They oppose the administration's public-private partnership concept for power development.
APPROPRIATIONS COMMITTEE CHIEFS: Sen. Carl Hayden (Ariz.) Rep. Clarence Cannon (Mo.)	They have a record of going along with Roosevelt-Truman spending programs. They may talk economy, but they won't legislate it.
PUBLIC WORKS UNIT HEADS: Sen. Dennis Chavez (N. Mex.) Rep. Charles A. Buckley (N. Y.)	The senator will back the Eisenhower road program. Mr. Buckley is a believer in big federal make-work spending.
COMMERCE COMMITTEE CHAIRMEN: Sen. Warren G. Magnuson (Wash.) Rep. J. Percy Priest (Tenn.)	Both men, plus Rep. Herbert C. Bonner (N. C.), chairman of the House Merchant Marine Committee, will try to help business and should create little friction.
SENATE FINANCE, HOUSE WAYS & MEANS: Sen. Harry F. Byrd (Va.) Rep. Jere Cooper (Tenn.)	The senator will work well with Mr. Eisenhower. Mr. Cooper wants higher personal income tax exemptions, no corporate tax relief.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CLUTCH: Heavy-duty 16-inch diameter single plate.

TRANSMISSION: 4 speeds forward, 4 speeds reverse through the full reversing transmission.

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WHEEL FORKS: Exclusive one-prong construction to simplify tire changing. Has heavy 4½" axle for capacity loads to 50,000 pounds.

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Reduced clutch wear, maximum power and torque, no stalling on grades or lugging of engine at low speeds, less wear-and-tear on tires.

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For Christmas '54: Bring the Whole Family

This year's company Christmas mixture will be heavy on children. For the older end, there will still be a few old-fashioned Old-Fashioneds.

"FAMILY-PLAN" is the new look in company Christmas parties this year. High jinks are on the way out.

The change will prompt few groans from management. Indeed, it's largely management-inspired, pressured by personnel problem hangovers and a developing social conscience. Associated Industries of Cleveland has just studied the situation. Although the survey was of Cleveland-area firms, the size and business of companies were so diversified that they probably mirror national conditions.

For the Children—About 75 per cent of all company parties this year will be for the children. Most of them will be given in auditoriums, neighborhood movie houses and hotels. Most will be held around Dec. 18 or 19.

Gifts play a big part in making the children happy. Selections range from packages containing seven toys such as piggy banks and plastic horns to the traditional stocking filled with assorted toys and candy. Some companies vary these gift packages according to age groups and have different gifts for boys and girls.

Food—Food is just about as important. Variety here ranges from a box of popcorn to a turkey dinner with all the trimmings. Most children's parties feature candy, popcorn, nuts and fruit rather than a meal—eliminating a number of problems where smaller fry are concerned.

The report shows that some companies provide bagged assorted candy to each child as he comes in. Others play it safe and give these things out as junior leaves, sparing body, premises and clothes, at least until afterwards.

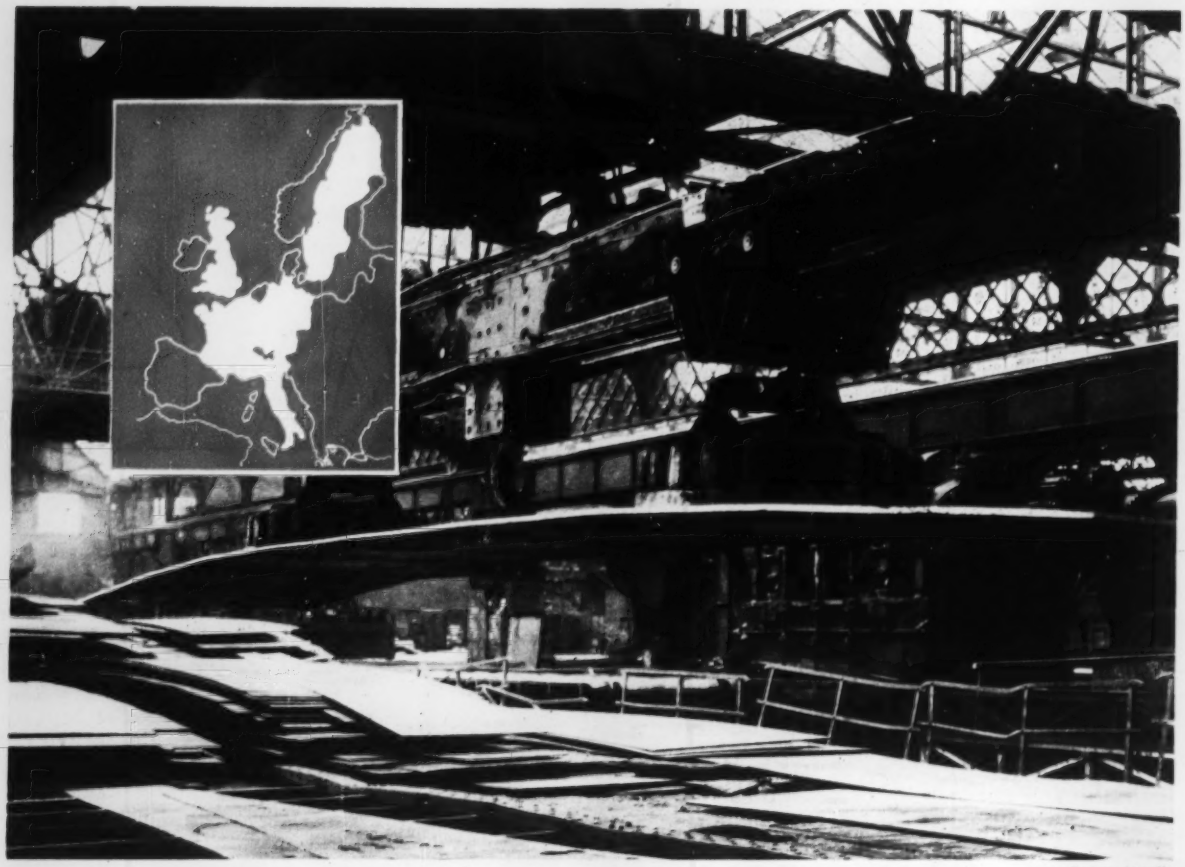
And Fun — Entertainment is also a big item. Programs range from Walt Disney cartoons to acts by professional clowns, Santa Clauses, jugglers and magicians. Management experience shows that children like lots of amusement. The acts often take up a large part of the 2½ hours the average party lasts.

The Reckoning—Minimum cost of a Christmas party reported to the AIC was $1200. Maximum was $10,000 and the average of the 12 companies covered by the survey was $4365. These figures include all costs, from gifts to hall rental. Of the 12 companies, four had more than 1000 employees, four between 500 and 1000 and four between 100 and 499. Cost of the party was usually in direct proportion to company size.

Here's what one company will get for its money. It will spend $3500 on employees' children during a two-hour party at a Masonic Temple. Six Disney cartoons will be shown, with one "live" professional act.

Gifts—Youngsters under seven will get one and those over seven will get two gifts from Santa Claus and his helpers as they leave. A total of 1500 gift packages is ordered. The feature will be the grand drawing of prizes, with dump trucks, walking dolls and bicycles to be won.

The company also has separate parties for men and women employees. These cost a total of $3280. Both are held in downtown clubs. Women get a turkey dinner, corsages, music and a talent show. The men have roast beef, and a stage-money auction for 60 gifts, such as steam irons and electric roasters. As a sop to the high jinksers—there's a cocktail hour!



France Actuelle

An active steelmaking year gives the tipoff that . . .

France and Belgium Are Keyed Up to Competition

FRANCE . . .

The main French effort in '55 will be to break production bottlenecks, reduce prices

FRENCH METALWORKING proved itself equal to 1954's competitive race. And France's effort to improve its share of world markets in 1955 is exemplified by its steel industry.

Steel operations in 1954 will probably exceed the 11 million net tons produced in 1953 (the 1952 level was about 12 million net tons). A seven-year reconstruction program was completed in 1953 ($971 million) and another four-year modernization program will be started next year ($714 million). Expenditures on capital improvements in 1954 will be $258 million.

Purposeful — Modernization is planned in raw materials handling and finishing operations. End idea is to break bottlenecks of supply and create better, more efficient production units which will be competitive with any in the European Coal & Steel Community. Expansion planned is expected to up production capacity to 16 million net tons annually.

In the steel industry, there is a trend toward integration of smaller firms into larger combines. The most important merger of 1954 was the formation of Societe des Ateliers et Forges de la Loire. Seven plants owned by four separate concerns were brought under one control. Aim is to reduce production costs 25 per cent, increase output 60 per cent—to 15,950 net tons monthly.

Follows Naturally—In line with the steel industry pattern, other industries also hope that mergers can improve their position in the competitive race. Take the French automobile industry: Ford Motor Co. has established a new French subsidiary, Ford (France) S. A., which will handle sales in France and French territories of cars, trucks and tractors made by Ford in the U. S., England and Germany. Merged were the old Ford S.A.F. of Poissy, France, and SIMCA, another French auto producer, which combine 4.3 per cent (Ford) and 16.6 per cent (SIMCA) of French automaking

capacity. Establishment of the new Ford subsidiary at the time of the merger means Fords will continue to be sold in the French market, says Henry Ford II. It also means price reductions like French Ford's cut to $2280 for its 1955 model from $2670 for its '54 model.

The French automotive industry passed expectations in 1954. Output through August was:

	1954	1953
Total Output	380,232 units	315,465 units
Export	94,166 units	71,510 units

Informed guesses peg 1954 output at about 570,000 units, compared with 500,000 for 1953 and 1952.

Integrate, Consolidate — Watchwords for the French metalworking industries are "integrate" and "consolidate." Frenchmen seem to feel a good product in 1955 will go only as far as it can get on its price. Cutting production bottlenecks to get a lower price will be the main French effort.

BELGIUM . . .

Belgium regards its success in export markets as only a bare minimum, wants more

COMPETITION in 1954 didn't catch the Belgians napping.

Belgian steel output rose to about 5.4 million net tons in 1954, some 400,000 net tons over 1953's production.

In Balance—Belgian metalworking firms exported about $400-million worth of goods out of a total production of $1140 million—an improvement over the preceding year. Belgium traditionally exports about half its metalworking output.

Employment in metalworking industries increased some 5000 workers during the course of 1954 to a total of 172,500.

However, the year was not one of easy sales or equal advance by all segments of metalworking. Construction declined, but boilermakers were busier than in 1953. Production of hardware, heating equipment and small tools held its own. Even into the fourth quarter, iron and steel foundries, as well as fastener makers, were uncertain whether they would be able to equal last year's volume. Sales declined in machine tools and compressors but increased in motors and chemical equipment.

Big Lesson — If there is one thing the Belgian businessman learned from the "normal" competitive market of 1954, it's this: The essential requirement for Belgian industry is to become and remain versatile, to be able to change and adapt its manufacture to the demands of the current market.

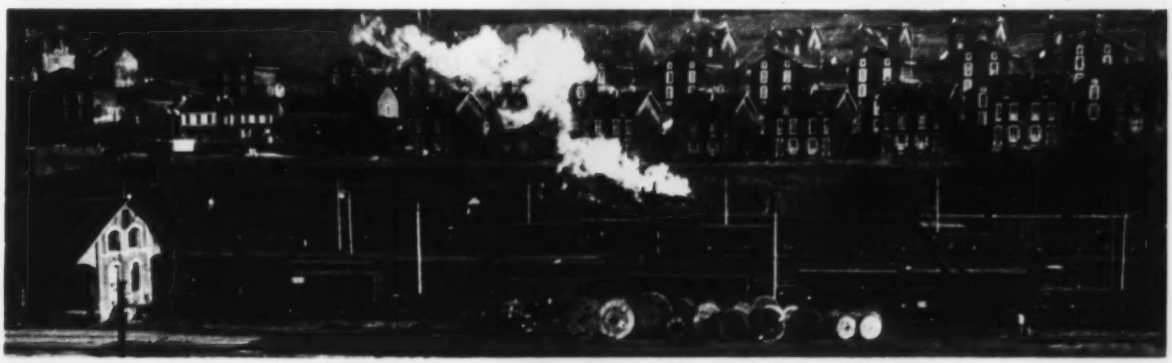
Belgians reason: Because the domestic market will not support its metalworking industry, about half its metal products must be sold overseas. To do this, Belgium must offer what customers there demand, when they demand it. Belgians like to be there first with quotations. That's one reason why the number of clerical and sales people in industry is about 20 per cent higher than it was in 1948-49.

Aims and Results—Technically, Belgian metalworking men try to be two years ahead of competition and commercially first in line at any new market. Often this goal is impossible, but that is the kind of thinking that spurred a Belgian law decreasing taxes to firms which made productivity investments. The same kind of thinking was behind the new steel industry research organization, founded to study production and use problems. The first part of the research program was aimed at establishing admissible tensions for structural steels on the basis of their elastic limits. Possible reductions in construction costs resulted. Allowable increases recommended range from 6 to 22 per cent.

A final reality has come home to Belgian metalworking men during 1954. Not since the end of World War II has the European machinery market been without a build-up influence. First it was reconstruction, then Korea. Now, the traditional European market is more or less closed to a great part of Belgian-made machinery. The importing nations found it more economical to build the necessary equipment for themselves. Belgium's market is narrowed down to countries on a lower technical level. And that's where they'll come into direct competition with the U. S., Germany, France, England and Japan.

The Belgians know they must get a bigger share of the less-developed world market. So American firms may feel increased Belgian competition next year.

HERE are two more articles in a series on the economic presents and futures of major western European countries. On Dec. 6 we wrote about Italy and Sweden. Next week we discuss Great Britain and West Germany



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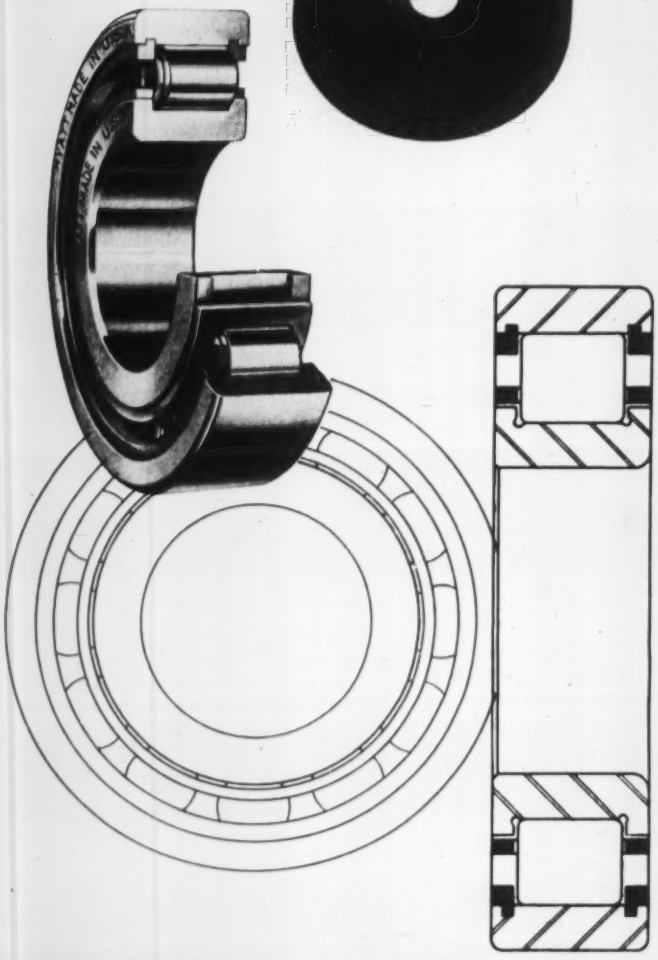

U indicates inner race flanged at both ends

T indicates outer race has 2 retaining rings

S indicates rollers spaced circumferentially by separator

This non-separable Hyatt U-TS is widely utilized for applications where: (1) no provision is made to retain the outer race endwise, or (2) the bearing must be assembled as a unit. It is available in the 1200, 1300, 5200 and 5300 series.

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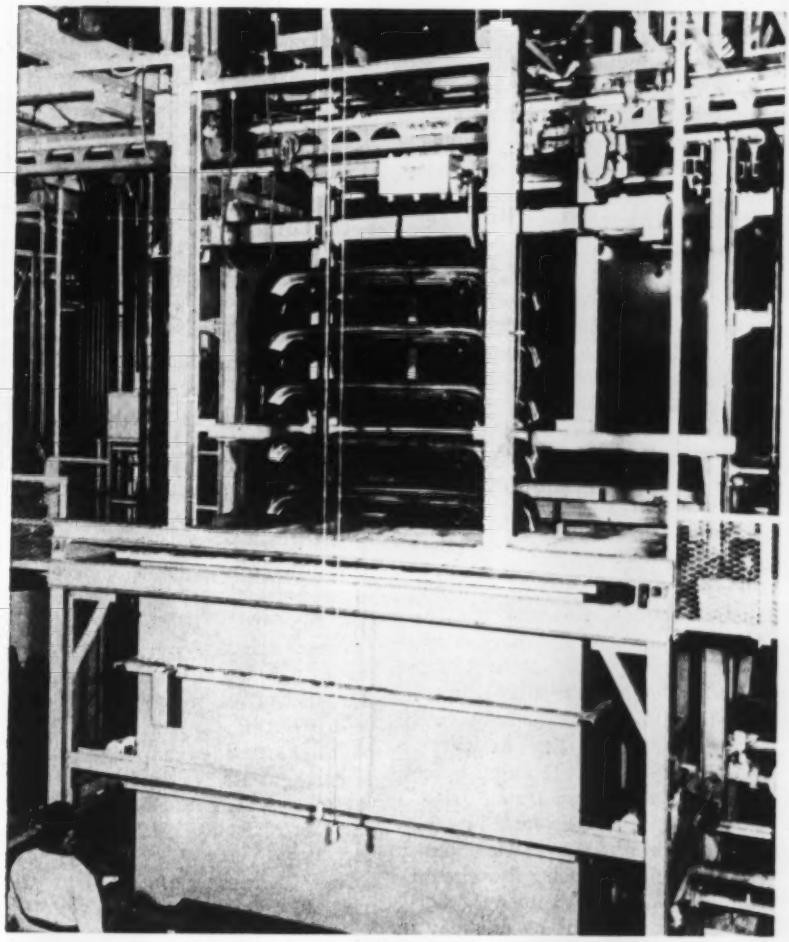

Udylite's more-than-man-sized plating machine

Plating by the Acre

At home with Pontiac's automation is a giant unit that can plate 500 acres of bumpers and front-end trim a year. Only two girls are needed to operate the device

DETROIT

UP AT PONTIAC they measure the output of bumper and front-end trim plating facilities at about 2 acres per day or around 500 acres per year.

Although such figures contain the implication the Indian's putting chrome on the range, bumpers, unfortunately, are not quite so happy a plating prospect from a configuration standpoint.

Problem—Styled to approximate the profile of a rocket ship, these orginal "wrap-around" components must be surrounded by anodes during plating for proper throw of the plate. This requirement, of course, stands contrary to the conventional automatic straight-line plating machine in which the work carrier enters at one end of the plating tank and travels between rows of anodes to emerge from the plating bath at the opposite end.

In essence a handling problem, the desired characteristics are neatly embodied in the Udylite Corp. automatic selective cell plating machine doing the bumper job for Pontiac. Operating on a 2-minute cycle to plate 30 racks of bumpers per hour, the machine gives hourly production of 360 bumpers, which is comparable to expectations from conventional facilities. More impressive yet, the machine can be operated by two girls polishing their nails.

Appearance—In general appearance, the machine is striking in that it is completely above the floor, well-shrouded and clean. Because it is devoid of the customary roller chain, only occasional glimpses of the work in progress may be seen throughout its 460 foot length. Encircling the machine is a tramrail system, with a motorized carrier on which the work carriers are delivered to and removed from the machine.

The loop of the tramrail around the machine is supplemented by a second joining loop forming a figure 8. It encircles a storage area in which loaded racks are placed when the machine is emptied at night or over the week-end. When operations begin, the operator draws from this area, and the machine runs for two hours before the first parts emerge to be removed from the racks and to be replaced with parts to be plated.

Efficiency—The extreme degree of efficiency in the utilization of plating racks is a notable feature of the machine. It is normal for an auto plating installation to involve as much money in the plating racks serving the machine as in the machine itself, with perhaps half of the racks traveling empty to be reloaded and start the cycle. Of the 94 racks used by the Udylite machine, only about four are out of service during the normal plating cycle at a given time.

Key to the efficiency of the machine is not only the tramrail system which functions in principle as a power and free conveyor system but also the automatic handling system within the plating equipment. Work carriers are deposited by the tramrail on the

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automatic system, and while the work carrier is advanced from cell to cell for the 37 plating steps, the tramrail carrier moves on around and removes parts emerging, delivers more, etc.

Progression — Work progress within the machine is by an up-over - and - down - into - the - next - cell arrangement, with the exception of the tanks requiring less time where the chrome plating is done. Here, constant operation is maintained by a system through which empty cells are selected in sequence to accommodate racks as they emerge from the preceding operations. The handling system is the more striking for its mechanical simplicity coupled with its efficiency.

Another feat of handling, across the aisle from the plating facilities, is the polishing department where the bumpers are prepared for plating. The three major pieces that comprise the bumper-grill facade of the Pontiac are loaded onto a conveyor and proceed automatically down through a maze of emery belts and buffers strategically positioned to polish the entire exterior surface without human assistance; they emerge ready to hit the plating tanks, though visual inspection and occasional touch-up are required.

The Udylite machine as the latest thing in plating handling seems appropriately at home with Pontiac's automation.

Pontiac—No Scalper in '55

A week spent driving the Pontiac Star Chief four-door sedan indicates that dollar for dollar the Pontiac is an excellent value.

To styling, which reflects in modernized format the traditional Indian personality, Pontiac adds this year the acceleration and cornering ability of a pinto pony coupled with an absence of nose-dive in braking that completes a notable feel of stability in the car. This saddle-some stability is further enchanced by a ride sensation, which while not uncomfortably firm, has a residual solidity. Certainly the improved handling of the car more than justifies the element of compromise required to achieve it.

Roll in corners is slight by American standards and is not appreciably increased by hard cornering. Mounting of the rear springs outside the frame, a la Corvette, undoubtedly plays a key role in roll reduction and the ride-handling result is outstandingly good. Acceleration in the driving ranges is excellent and 0-60 mph comes in about 13 seconds or so.

A few criticisms can be found in the dashboard layout, which puts the cigarette lighter in front of the passenger and the ash tray in front of the driver. The red-line speedometer is an interesting idea which would benefit from having the line more closely under the numbers and calibrations for easier reading. Oil pressure and ammeter are red warning lights—a universal tribute to the disinterest of the motorist in the welfare of his machine.

The standard seat drew comments of unusual firmness, indicating that foam rubber is a good option to buy if you're contemplating the car, though those liberally endowed with natural padding will perhaps not find this fault. A tendency also exists to bump knees on the exposed wrap-around windshield corner when entering the car, though practice in this maneuver would undoubtedly curtail the complaint. Visibility, incidentally, is excellent by anybody's greenhouse standards.

Pontiac offers a car with outstanding roadability in 1955, an attribute which most motorists will welcome.

Auto, Truck Output

U. S. and Canada

	1954	1953
January	594,789	614,000
February	573,801	628,017
March	672,485	752,149
April	676,233	782,491
May	621,349	684,843
June	623,732	713,778
July	543,534	756,592
August	523,799	640,186
September	364,441	605,228
October	312,078	651,153
November	616,509†	457,852
December		529,588
Total		7,815,877

Week Ended	1954	1953
Nov. 6	116,179	133,783
Nov. 13	141,154	115,748
Nov. 20	160,097	108,729
Nov. 27	134,858	74,290
Dec. 4	169,438	123,148
Dec. 11	171,000*	113,145

Source: Ward's Automotive Reports. †Preliminary. *Estimated by STEEL.

Packard—Torsion Bars, Power

Packard for 1955 will feature the highest horsepower in the industry coupled with wrap-around windshield and new styling. But even more important in the eyes of many will be the new torsion bar suspension.

Utilizing an electrically controlled compensator, which keeps the car level regardless of the passenger load by winding up the torsion bars, the suspension system is incredibly superior to present efforts in the ride department. Bumps on a test road which smacked heads against the roof of conventional cars were smoothed to car-track jolt proportions in the new Packard.

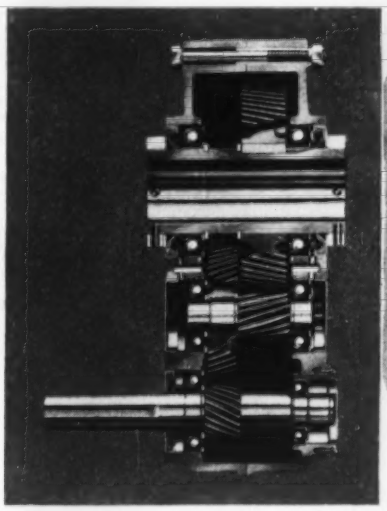
Basic function of the bars in achieving the effect is to transmit the wheel movement to the center of the car frame. Instead of pitching, the car body raises throughout its length horizontally and is actuated by the fulcrum of the lever only slightly. Cornering in the car is virtually flat despite softness maintained in the ride department.

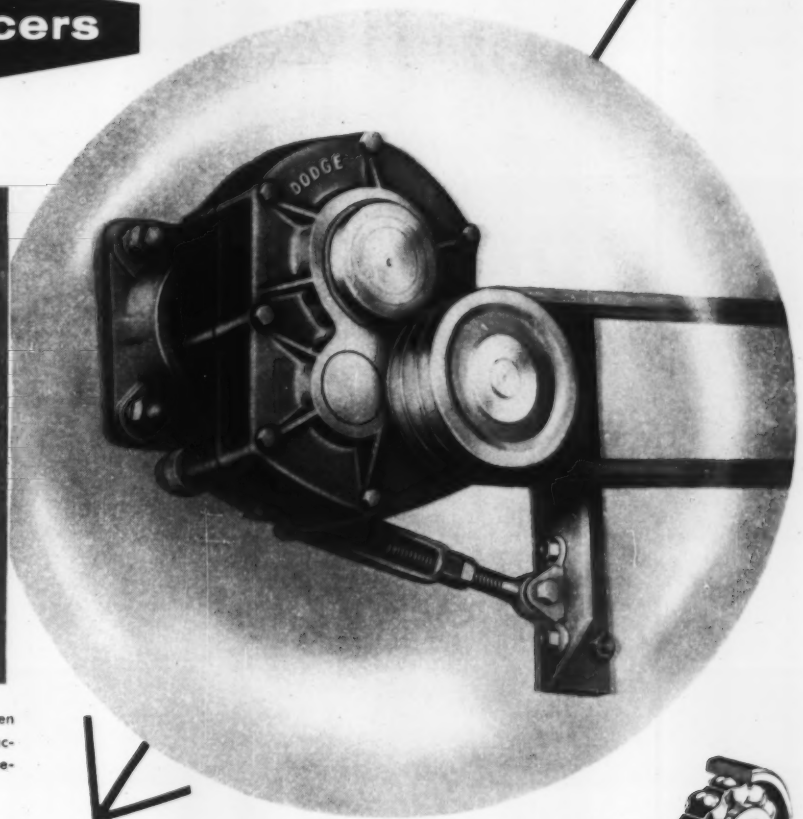
People already impressed with the 25,000-mile run at a 104.7 mph average, including pit stops, will find these babies real eye-openers when they're introduced Jan. 5. The 20,000 orders already placed show Packard should definitely be a strong contender in the fine car field during the year ahead.

New Auto Record Predicted

Automakers plan a record first quarter output in 1955, says *Ward's Automotive Reports.* New monthly peaks for January, February and March are being essayed with the industry goal around 1,928,500 cars, 40 per cent more than in this quarter. Quarter record to date is 1,898,783 cars produced during July-September, 1950 . . .Auto replacement parts dollar sales for third quarter, 1954, were up 4 per cent from second quarter. For the first 9 months, sales were off 5.7 per cent from last year but up 2.9 per cent from the like 1952 period.

Reducing Costs In Speed Reducers





New Departure **ball** bearings are used in seven basic sizes of the Dodge single and double reduction speed reducers, handling from 1 to 43 horsepower at output speeds from 12 to 330 r.p.m.

. . . with NEW DEPARTURES

Dodge Manufacturing Corporation's Speed Reducers make good use of design advantages offered by New Departure snap-ring **ball** bearings.

The snap rings locate the bearings in the case, eliminating the need for adjustment. Doing away with threaded or shim-type devices permits straight-through boring of the housing. Thus split-case construction is highly practical, and assembly is greatly simplified. The result is a rigid, highly efficient unit, and one in which production costs have been kept to the minimum.

Learn what New Departure can do for *your* product. Talk with your New Departure sales engineer—*today!*

NOTHING ROLLS LIKE A BALL

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BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT
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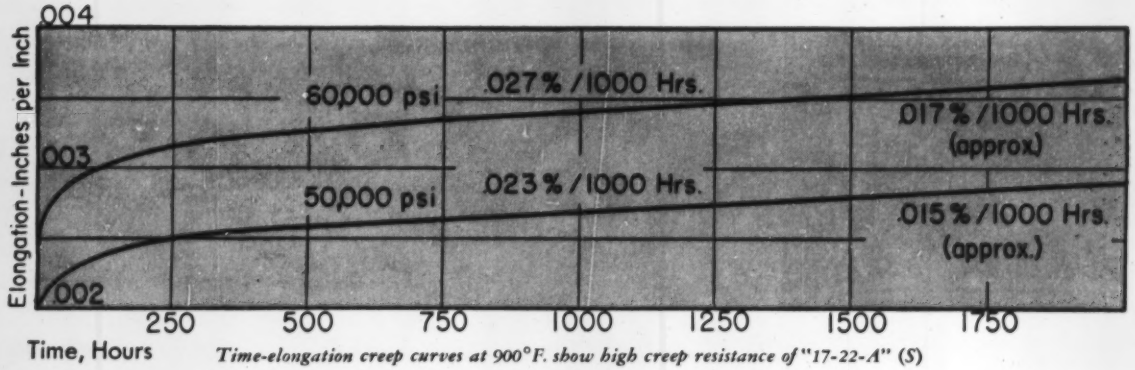
NEW DEPARTURE SALES ENGINEERING OFFICES—AT YOUR SERVICE

BRISTOL	269 North Main St.	2-6371	**DETROIT**	7-122 General Motors Bldg.	Trinity 2-4700	**KANSAS CITY**	1021 E. Linwood Blvd.	Valentine 4939
BOSTON	517-A Park Square Bldg.	Hancock 6-9867	**CINCINNATI**	2107 Carew Tower	Main 5783	**MILWAUKEE**	647 W. Virginia St.	Broadway 6-9460
KANNAPOLIS, N. C.	P. O. Box 1086	2-3181	**CLEVELAND**	3113 W. 110th St.	Winston 1-5454	**ST. LOUIS**	3001 Washington Blvd.	Franklin 6533
NEW YORK	1775 Broadway	Circle 6-1540	**INDIANAPOLIS**	1357 W. 18th St.	Imperial 4680	**LOS ANGELES**	5035 Gifford Ave.	Logan 8-2301
PHILADELPHIA	850 E. Luzerne St.	Garfield 3-4136	**PITTSBURGH**	Cathedral Mansions	Mayflower 1-8100	**BERKELEY**	1716 Fourth St.	Landscape 6-8750
SYRACUSE	2360 James St.	73-5195	**CHICAGO**	332 So. Mich. Ave.	Wabash 2-5875	**SEATTLE**	5000 First Ave., S.	Lander 5920
			DAVENPORT	2212 E. 12th St.	Davenport 7-7522			

SAVE ALLOYS, GET HIGH ALLOY PERFORMANCE IN GAS TURBINES WITH "17-22-A"® (S) STEEL

Contains less than 3% alloy

Gives maximum creep resistance to 1000°F.



Time-elongation creep curves at 900°F. show high creep resistance of "17-22-A" (S)

IF your gas turbine parts operate at temperatures not exceeding 1000°F., you can save critical alloys, yet get high alloy performance by using "17-22-A"(S) steel produced by the Timken Company.

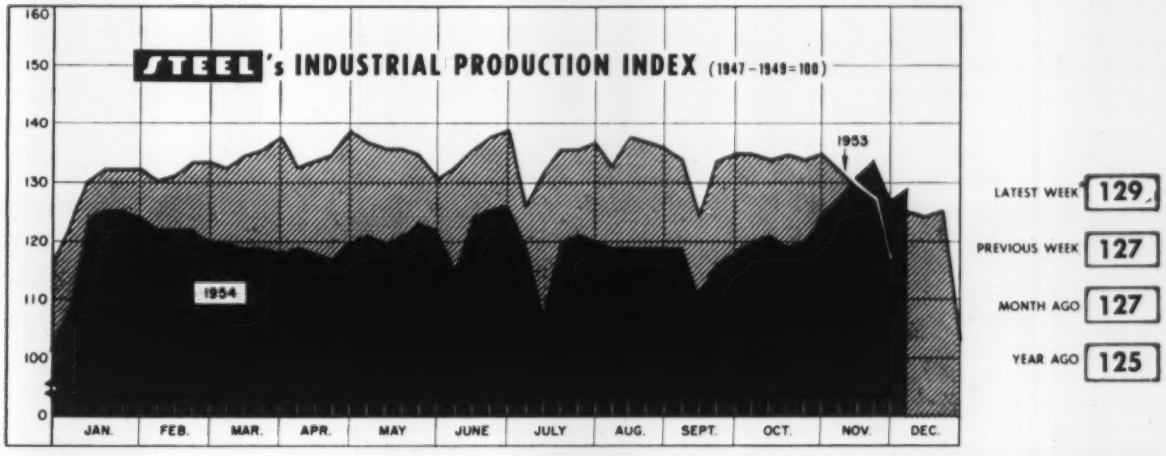
"17-22-A"(S) steel contains less than 3% alloy. It permits you to cut costs. Developed by metallurgists of the Timken Company, "17-22-A"(S) has been used successfully for 10 years in refinery and steam power applications. The graph above shows its creep resistance at 900°F.

"17-22-A"(S) also resists heat checking and thermal cracking. It is readily workable up to 2300°F. It's easy to machine and weld. Maximum high temperature properties can be developed by normalizing and tempering, minimizing the possibility of distortion and quench cracking.

For complete information on "17-22-A"(S), and its companion analysis, "17-22-A"(V)—used at temperatures up to 1100°F.—write for Technical Bulletin Number 36A. And for help with your high temperature problem, call upon our Technical Staff. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended Dec. 4.

Based upon and weighted as follows: Steel Output 35%; Electric Power Output 32%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Report) 11%.

Construction Builds Records but Still Trails Demand

A NEW ALL-TIME RECORD for construction awards has been set in 1954. November building and contracts in the 37 eastern states, compiled by F. W. Dodge Corp., bring the 11-month total to $17,941,370,000. That's 11 per cent ahead of the like 1953 period and almost $500 million more than the whole of last year.

Awards for November hit $1,498,850,000, the highest total for the month in Dodge's 63-year history. Residential building made the biggest gain over the 11-month period, 28 per cent ahead of last year. In 1955, most predictions point to activity at about the same level in this area of construction.

Up and Down—Public and private works and utilities are ahead of 1953 by 3 per cent (for 11 months), while nonresidential building was down less than 1 per cent. The fall in nonresidential can be attributed to several large atomic energy project contracts that swelled last year's totals. If the atomic contracts are left out, nonresidential building shows a 7 per cent gain over a year ago.

Commenting on those trends, Thomas S. Holden, vice chairman of the statistical firm, says: "The record volume reflects mounting demand resulting from rapid population growth and high productivity of the economy. Current record-breaking activity is no more than keeping pace with demand for most structures and is actually behind in at least two categories, schools and highways."

Crystal Ball—Forecasts for business in 1955 continue to grow in both numbers and optimism. Gordon W. McKinley, chief economist for Prudential Insurance Co. of America, says in American Management Association's "Financial Management Series":

1. Total government spending in 1955 will remain at its present rate of about $49 billion annually. 2. Inventories are on the bottom now; companies will be spending roughly $4 billion more than in 1954 to hold stocks at present levels. 3. Capital spending by business will

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,944	1,941	1,955
Electric Power Distributed (million kwhr)	9,165[1]	9,087	8,582
Bitum. Coal Output (daily av.—1000 tons)	1,227	1,483	1,237
Petroleum Production (daily av.—1000 bbl)	6,245[1]	6,270	6,179
Construction Volume (ENR—millions)	$302.8	$254.2	$145.1
Automobile, Truck Output (Ward's—units)	169,438	134,858	123,148
TRADE			
Freight Car Loadings (unit—1000 cars)	624[1]	584	662
Business Failures (Dun & Bradstreet, no.)	220[1]	226	202
Currency in Circulation (millions)[3]	$30,350[1]	$30,412	$30,791
Dept. Store Sales (changes from year ago)[3]	0%	+2%	−4%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$17,876	$20,031	$16,947
Federal Gross Debt. (billions)	$278.9	$278.8	$275.3
Bond Volume, NYSE (millions)	$25.6	$23.5	$15.5
Stocks Sales, NYSE (thousands of shares)	16,822	13,688	8,525
Loans and Investments (billions)[4]	$86.0	$85.7	$80.4
U. S. Gov't. Obligations Held (billions)[4]	$37.4	$37.7	$32.7
PRICES			
STEEL's Finished Steel Price Index[5]	194.53	194.53	189.74
STEEL's Nonferrous Metal Price Index[6]	217.4	217.8	204.8
All Commodities[7]	109.5	109.5	110.1
Commodities Other Than Farm & Foods[7]	114.5	114.5	114.6

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1954, 2,384,549. 1953, 2,254,459. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100.

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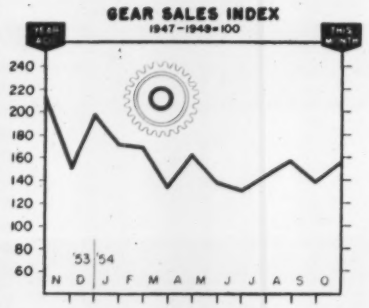
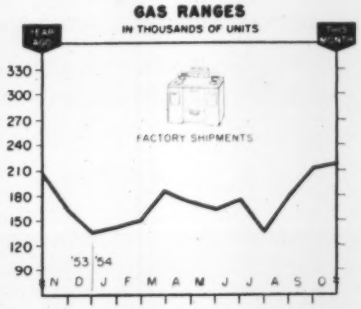


	1954	1953	1952
Jan.	167.4	161.4	670.6*
Feb.	165.1	188.1	539.5*
Mar.	128.6	158.9	517.1*
Apr.	158.2	217.1	478.7*
May	132.5	189.8	425.9*
June	127.4	146.5	452.3*
July	141.3	120.7	145.3
Aug.	154.7	121.6	132.3
Sept.	135.1	135.6	143.4
Oct.	152.3	211.1	160.8
Nov.	....	144.9	150.9
Dec.	....	194.0	140.9

*(1935-39=100)
American Gear Mfrs. Assn.

Charts Copyright 1954 STEEL.



Shipments—Units	1954	1953	1952
Jan.	137,000	169,200	166,100
Feb.	152,900	185,900	166,200
Mar.	188,200	208,200	185,200
Apr.	172,400	220,300	182,300
May	163,800	181,000	162,800
June	174,300	166,600	175,700
July	134,500	159,000	154,200
Aug.	179,400	186,800	178,600
Sept.	213,300*	209,500	199,600
Oct.	217,100*	203,900	239,700
Nov.	.....	158,500	186,400
Dec.	.....	134,400	178,600
Total	.....	2,183,300	2,175,400

Gas Appliance Mfrs. Assn.
*Preliminary.

at worst hold its own, may rise $500 million over 1954's total, with most of the increase going for more construction; durable equipment purchases are likely to remain at present levels. 4. Personal consumption expenditures will go up by $9 billion.

More Work—The last forecast is based on the following estimates: Increase in the labor force of 800,000, the number of employed to rise by 1.5 million; average hourly wage to go up 4 cents; and the average hourly work week to remain at about 39.8 hours.

Adding everything up, Mr. McKinley comes up with a gross national product in 1955 of around $368 billion. GNP in 1954 will be about $356 billion.

Steady Advance—On that basis, he says: "We can look forward to 1955 with considerable optimism. It won't be a boom year. What we will have will be a quiet, steady advance in our standard of living on a sound and efficient basis—a good laying of the groundwork to insure prosperity in the years to follow."

In 1965: $540 Billion . . .

Looking farther ahead to 1965, Mr. McKinley sees a GNP of $540 billion, half again as much as 1954. He says: "Such a rise seems impossible until we think back to the fact that in 1939 GNP was only $91 billion."

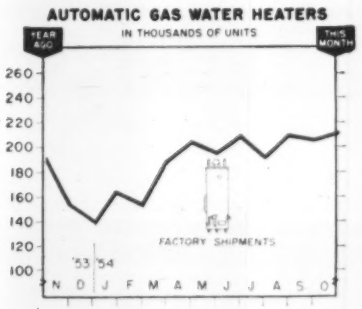
Tied in with the upward jump are higher population, income and business expenditures. To just keep our present standard of living, production will have to go up at least 20 per cent over the next 10 years, he says.

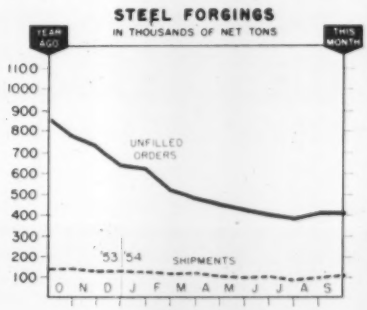
Another forecaster of good business in 1955 is Harlow H. Curtice, president of General Motors Corp. He expects GNP to exceed the record $365 billion set in 1953, which tallies pretty well with Prudential's Mr. McKinley.

Atoms Take a Back Seat . . .

Another forecast for 1965: Total electric generating capacity in the U. S. will reach 200 million kilowatts by 1965, double the present figure. But it's doubtful whether more than 3 million kilowatts will be atomic generated. That's the prediction of Philip Sporn, president of the American Gas & Electric Co.

Economical and technical considerations make it certain that the enormous requirements for electric power in the next 16 years will





	Shipments—Units		
	1954	1953	1952
Jan.	164,400	184,000	148,700
Feb.	175,000	188,500	145,800
Mar.	187,800	203,000	153,300
Apr.	200,800	204,400	153,300
May	195,600	179,000	155,300
June	206,700	175,800	159,000
July	190,300	173,800	131,300
Aug.	207,100	163,000	161,500
Sept.	205,500	175,300	171,200
Oct.	210,800*	189,200	185,300
Nov.	.....	151,900	167,100
Dec.	.....	137,800	178,600
Total	.....	2,125,700	1,910,400

Gas Appliance Mfrs. Assn.
*Preliminary.

	Shipments		Unfilled Orders	
	1954	1953	1954	1953
Jan.	139	184	638	1,207
Feb.	127	184	539	1,199
Mar.	130	200	489	1,197
Apr.	116	196	460	1,082
May	107	191	431	1,239
June	113	185	409	1,135
July	97	155	395	1,081
Aug.	102	151	410	974
Sept.	109	153	409	882
Oct.	...	156	...	798
Nov.	...	143	...	740
Dec.	...	143	...	651

U. S. Bureau of the Census. Data based on reports from commercial and captive forge plants with monthly shipments of 50 tons or more.

be satisfied primarily by conventionally fueled plants, he says.

None of the experimental atomic power plants under construction or consideration is likely to lead quickly to economical or competitive electric power, but each is expected to increase our knowledge of the subject and to teach us how to get costs down, which admittedly will take a long time, he added.

New Orders Top Shipments . . .

Now for some reports that add credence to the prevalent optimistic outlook. The Commerce department's Office of Business Economics says that manufacturers' new orders in October exceeded shipments for the second successive month. Shipments were also up, but the rise was slightly less than usual for this time of year. Inventory book values increased; they traditionally show no change in October.

Sales by all manufacturing companies of $24.6 billion were $200 million above September, though $2.2 billion under a year ago. Enough new orders were received by durable goods producers to boost backlog $300 million, with defense contracts to the transportation industry giving a healthy push.

Durable goods inventories went up by $250 million in October; most of the gain was related to the introduction of 1955 passenger cars. Gains in other industries should make a stronger showing in November.

Dollar Down, Dollar a Month . . .

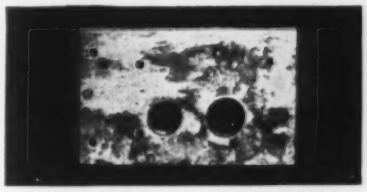
Rising business means continued consumer confidence — and that means buying. The consumer is still willing to part with his buck. Credit outstanding at the end of October was $17 million above September and $186 million higher than a year earlier.

Still, the rise for the month is a small one compared with $185 million and $521 million in the same month of 1953 and 1952, respectively. One reason why credit didn't take much of a bounce upward is that consumers are paying off their debts at a higher clip than they were a year ago.

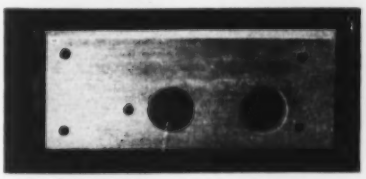
Another reason for the small rise was the waiting for consumers for new cars. Last year in October, automobile installment paper went up $113 million in October; this year it went down $25 million. November should see a big change, if preliminary reports from car dealers are accurate.

How Diebold, Inc.

keeps their SAFES SAFE from rust



This part from a Diebold safe door was covered with fingerprint neutralizer, then spotted with synthetic perspiration. In a matter of days destructive rust was apparent.



This Diebold safe door part was spotted with synthetic perspiration, covered with fingerprint neutralizer, then wrapped with Marvellum VPI. At the end of the test there was no indication of rust. The part was in the same excellent condition as the day it was made.

with MARVELLUM vpi WRAP

No wonder, after the tests shown above, Diebold Inc. chose Marvellum VPI® Wrap to protect their safes from rust. All ferrous metal parts are now kept wrapped from the moment they are made and each safe . . . large or small . . . is protected by Marvellum VPI before and during shipment. A special coating on the VPI paper vaporizes . . . forms an invisible protective film that positively prevents rust.

Marvellum VPI is easy to use . . . just fold the paper over the part. No need for time-consuming slushing or greasing. No mess or costly cleaning when the item is unwrapped. It's bright and clean, ready for immediate use.

You'll find many uses for Marvellum VPI in your plant . . . wrap steel parts, protect inventories, line tote boxes.

Marvellum VPI is available in rolls of 20, 30, 40 and 60 lb. paper stock and *can be individually imprinted with your trademark* on quantity orders. Envelopes, sheets, bags, shrouds and tubes are also available.

Marvellum VPI Wrap is made in compliance with Military Packaging Specification MIL-P-3420.

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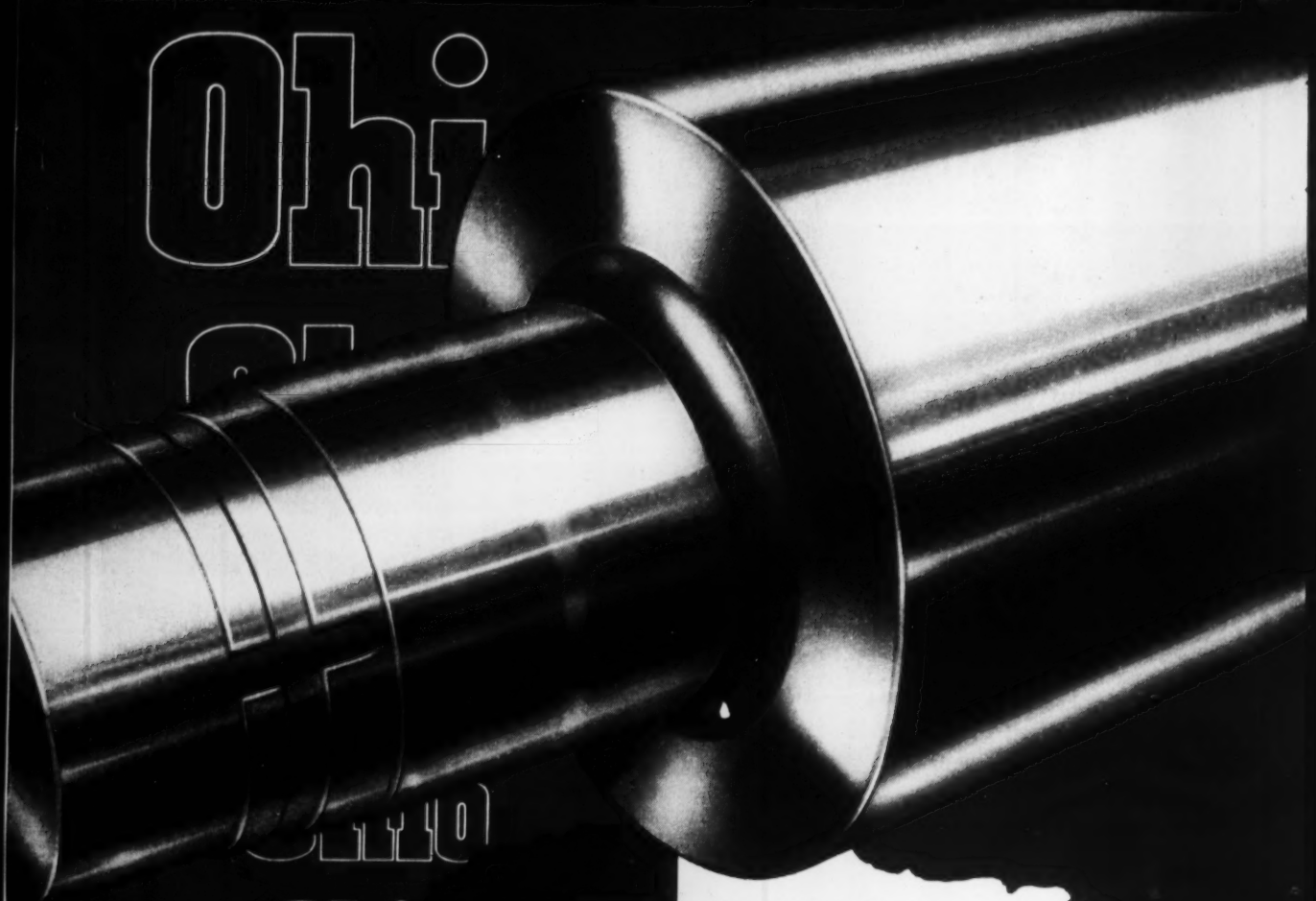

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THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO — PLANTS AT LIMA AND SPRINGFIELD, OHIO

MILTON T. SMITH
. . . Marion Power Shovel v. p.-gen. mgr.

Milton T. Smith was elected vice president, general manager and a director of **Marion Power Shovel Co.** and its subsidiary, **Osgood Co.**, Marion, O. The companies were recently purchased by Merritt-Chapman & Scott Corp. Mr. Smith was associated for 26 years with Bucyrus-Erie Co., serving since 1950 as vice president in charge of purchases and inventory. As a director of Marion Power Shovel, he replaces **Louis Goldberg.** He succeeds the late **John Lacey** as a director of Osgood.

Harry E. Cravlin was elected vice president-general manager, **Claude B. Schneible Co.**, Detroit. He was production manager, Lincoln-Mercury Division, Ford Motor Co.

Gustav Schwab Jr. was made manager of the Marietta, O., pipe fabrication plant, machinery division, **Dravo Corp.** Since 1951 he has been assistant purchasing agent for the corporation.

D. J. Williams, manager of the western region-railroad sales, **Air Reduction Sales Co.**, was appointed manager of the railroad department. He continues headquarters at Chicago.

Edwin Vereeke, vice president-sales, was promoted to executive vice president of **Heil Process Equipment Corp.**, Cleveland.

GEORGE W. KESSLER
. . . B&W's chief engineer-boiler div.

George W. Kessler was made chief engineer of **Babcock & Wilcox Co.'s** boiler division, Barberton, O. He has served as assistant chief engineer for the division since April, 1953.

F. C. Weiblen, treasurer, was named vice president in charge of treasury, purchasing and stores and stock departments of **Bucyrus-Erie Co.**, Milwaukee. **G. Y. Anderson** was elected vice president-engineering to succeed **P. S. Stevens,** who retires Dec. 15. **V. C. Studley,** newly elected treasurer, has been assistant to the president for the last year.

A. O. Smith Corp., Milwaukee, appointed **Reginald M. Hislop** director of quality control to succeed the late **R. S. Saddoris.**

L. H. LaMotte, vice president-sales, and **A. L. Williams,** vice president-treasurer, were elected executive vice presidents of **International Business Machines Corp.**, New York. Mr. Williams continues as treasurer. **T. V. Learson** was promoted to vice president-sales.

Package Machinery Co.'s newly acquired subsidiary, **Reed-Prentice Corp.**, Worcester, Mass., elected **Roe S. Clark** chairman; **Roger L. Putnam,** president; **Frederick W. McIntyre Jr.,** vice president-sales; and **Jackson R. Holden,** secretary and clerk.

STOWELL C. WASSON
. . . National Malleable v. p.-operations

Stowell C. Wasson was elected vice president-operations, **National Malleable & Steel Castings Co.**, Cleveland. He has been manager of the company's Chicago and Melrose Park, Ill., plants since 1943. In his new position, formerly held by the late **Walton L. Woody,** Mr. Wasson will have responsibility for operations at National's plants in Cleveland, Chicago, Indianapolis, Sharon, Pa., Melrose Park and Phoenix, Ariz.

Julius Olchen was made purchasing agent of **Republic Steel Corp.'s** Truscon Steel Division, Youngstown, to succeed **L. H. Ransom,** recently transferred to Republic's Cleveland headquarters as assistant manager of purchases. **G. Brant Shelburne** was made assistant district sales manager in Republic's Birmingham office.

At **Leece-Neville Co.**, Cleveland, **J. S. Allt,** secretary-treasurer, was elected vice president-treasurer. **P. K. Bremser, A. D. Gilchrist** and **H. J. Zuske,** formerly assistant vice presidents, were made vice presidents. **Miller B. Pennell** was appointed secretary.

J. L. Todd was made export manager, **Nash Motors Div.**, American Motors Corp., Detroit. He succeeds **S. I. Carlson,** retired. **M. L. Hudson** was made Nash export sales manager to replace Mr. Todd. **J. P. Goodyear,** assistant

ROBERT BARLEY
. . . Progressive Welder gen. sales mgr.

J. A. ACKERMANN
. . . Elwell-Parker chief engineer

J. ROBERT FERGUSON JR.
. . . U. S. Steel chief eng.-project dev.

export manager, has also retired.

Progressive Welder Sales Co., Detroit, appointed **Robert Barley** general sales manager. He has been assistant sales manager.

Adm. J. J. Clark, U. S. N., ret., was elected a vice president of **Radio Receptor Co. Inc.**, Brooklyn, N. Y.

Verle H. Erickson joined **Allied Metal Treating Corp.**, Kenosha, Wis., as metallurgist and general manager. For the last two years he has been chief metallurgist at American Steel Treating Co. He served in a similar position with Snap-On Tool Corp. for 22 years.

Chapman Valve Mfg. Co., Indian Orchard, Mass., elected **Ernest Cochran** president and general manager to succeed the late **John J. Duggan.** Mr. Cochran was executive vice president.

Robert F. Griffin, general superintendent, aviation division, was named chief engineer of the Herbrand Division of **Bingham-Herbrand Corp.**, Fremont, O. He will have charge of engineering, metallurgy, research and development for tools and forgings.

O. H. Schildknecht, sales manager since 1917 with **Maynard Electric Steel Casting Co.**, Milwaukee, was appointed chairman of the executive committee. **W. A. Chappie,** in production and sales work since 1924, was made sales manager.

J. A. Ackermann was appointed chief engineer, **Elwell-Parker Electric Co.**, Cleveland. He succeeds **J. C. Erickson,** who resigned due to ill health.

American MonoRail Co., Cleveland, elected **C. L. Fell** vice president-marketing. He was made sales manager, textile division, last July, and previously served as Detroit district manager.

Roy Dehn was appointed director of engineering, **Cleveland Crane & Engineering Co.**, Wickliffe, O. He is succeeded by **Alfred W. Schultz** as chief engineer, heavy machinery division.

J. Robert Ferguson Jr. was named chief engineer-project development, **United States Steel Corp.**, Pittsburgh. He succeeds **Norman C. Michels,** appointed assistant vice president-engineering for the Tennessee Coal & Iron Division.

Clarence L. Holmberg, general sales manager, **Inland Steel Co.**, Chicago, was appointed assistant to the vice president in charge of planning and administration.

A. J. Werner succeeds **A. A. Wagner** as president-treasurer, **Wagner Iron Works,** Milwaukee.

Lt. Gen. Harold L. George, USAF.,

ROY DEHN

ALFRED W. SCHULTZ

. . . new appointments at Cleveland Crane & Engineering

It gets its fuel through 1/4" tubing at pressures up to 1,700 psi

Meet the "Boss of the Crawlers"—Caterpillar Tractor Co.'s new 150 D.B. hp giant that toys with tons of earth, plays marbles with huge boulders, topples trees like tenpins.

Superior Tube supplies metal gullets through which such landscape levelers gulp their fuel.

Through ¼ inch O.D. tubing, diesel fuel is injected to cylinders at pressures up to 1,700 psi. So fuel injection tubing must be clean, have tremendous burst strength and resistance to fatigue. To meet Caterpillar's stringent specifications, Superior selects C-1008 Low Carbon Steel Tubing, draws it to size 250/255" O.D. x 0575/0675" I.D., then tests its mechanical properties to the utmost.

Result: heavy wall tubing with Rockwell hardness of B-65 maximum—capable of being cold upset without difficulty and cold formed into loops and bends without excessive springback. Bore is of uniform diameter, smooth and specially cleaned, and fracture testing and inspection at 15 power magnification assure freedom from cracks or seams of a depth greater than 5/1000 of an inch!

Scrupulous care in preparing, drawing and testing other grades of alloy and stainless Superior tubing makes them first choice for lubricating and cooling lines, governor shafts, valve spacers and valve push rods. One of our more than 55 analyses should be *your* choice, too, if you need trustworthy tubing and special help in adapting it to your use. Write us about your current tubing problem. We'll send you complete information and the appropriate catalog or technical bulletin by return mail. Superior Tube Company, 2005 Germantown Ave., Norristown, Pa.

Round and Shaped Tubing Available in Carbon, Alloy and Stainless Steels; Nickel and Nickel Alloys; Beryllium Copper; Titanium; Zirconium.

All analyses .010" to ⅝" O.D. Certain analyses in light walls up to 2½" O.D.

Superior Tube

The big name in small tubing

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. RAymond 3-1331

A. G. GILBERT
. . . a Heyl & Patterson sales manager

WILLIAM H. ASHTON
. . . works supt., AS&W central furnaces

DR. MAURICE J. DAY
. . . Crucible Steel research-div. dir.

ret., was elected senior vice president, **Ramo-Wooldridge Corp.**, Los Angeles.

A. G. Gilbert was appointed manager, standard products sales, **Heyl & Patterson Inc.**, Pittsburgh. He joined the firm in 1947 as contracting engineer, the position he now relinquishes.

E. C. Brekelbaum was made assistant to the general manager, **Thew Shovel Co.**, Lorain, O., with general authority on matters pertaining to methods, engineering and quality control.

Walter L. Roth was elected a vice president, **Luria Steel & Trading Corp.**, Chicago. **M. E. Fiterman** joins the firm as manager of alloys and nonferrous metals, effective Jan. 1.

J. H. Bowman Jr. was made manager of sales for the affiliated companies: **American Steel Band Co.** and **Allegheny Steel Band Co.** He has headquarters at the combined main office and plant at Carnegie, Pa.

William H. Ashton was appointed works superintendent at U. S. Steel Corp.'s **American Steel & Wire Division**, central furnaces and docks plant, Cleveland. He has been assistant division superintendent in the Carrie Blast Furnace Division, Homestead, Pa., district works.

Charles Tamburello leaves Business & Defense Services Administration to join **G. A. Feld Co.**, New York, as special representative in stainless steel sales.

Dr. A. R. Powell, associate manager, central research department, **Koppers Co. Inc.**, Pittsburgh, was named acting manager following resignation of **Dr. G. F. D'Alelio**, who remains with the company to carry out a special project on high-impact plastics.

Linatex Corp. of America appointed **William MacDonald** sales manager. He has headquarters in the newly opened offices in New York.

Dr. Maurice J. Day was made director of research and development for **Crucible Steel Co. of America**, Pittsburgh. Dr. Day was formerly associated with the Armour Research Foundation, Illinois Institute of Technology, where he was assistant director in charge of program development.

Richard Boke heads **Reynolds Metals Co.'s** new irrigation division, Louisville, a marketing division for lightweight sprinkler irrigation systems.

United States Steel Corp., Pittsburgh, appointed **Phillips Hawkins** assistant to the vice president-raw materials.

Andrew Kolar succeeds **Henry M. Coen**, retired, as head of **Link-Belt Co.'s** purchasing department, Chicago.

Leo T. Daigle was made general manager, **American Cable-Link Co.**, Detroit, successor to Cable-Link Conveyor Corp.

OBITUARIES . . .

Edward R. Wehr, 72, chairman of the board and a founder of **Wehr Steel** Co., West Allis, Wis., died Nov. 27.

Roy W. Wilson, 60, founder, president and director of **Advance Aluminum Castings Corp.**, Chicago, died Nov. 29.

Fred G. Robb, 72, former West Coast manager, **Dura Metallic Corp.**, died in Los Angeles Nov. 16.

Lawrence L. Anthes, 78, former president, **Anthes Foundry**, Toronto, Ont., died Nov. 23.

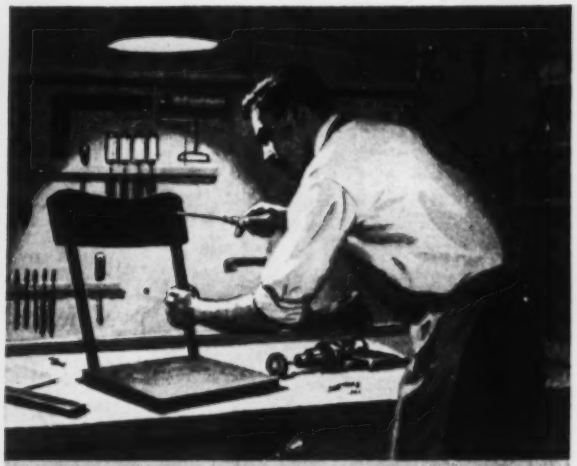
John J. Regan, owner, **Philadelphia Steel & Iron Co.**, Conshohocken, Pa., died Nov. 20.

F. G. Hoover, 71, former president, **Hoover Co.**, Canton, O., died Dec. 3. He resigned in 1951.

James B. Rohde, 61, president, **Callahan Can Machine Co.**, Brooklyn, N. Y., died Nov. 27.

Samuel C. Osborne, development manager, fin and coil department, **Carrier Corp.**, Syracuse, N. Y., died Nov. 28.

6:00 P.M.—HOME. This is John's house, of which he is justly proud. Note that a sturdy chain link fence protects his privacy and property. On his windows you'll find insect wire screening. Springs on his doors. TV Guy Wire on the roof. Flower bed borders in his garden.



8:00 P.M.—WORKSHOP. John is a "do-it-yourself" man. This is his workshop. He probably doesn't realize it but the screw driver he's using is made from wire. The wire brush on his buffing wheel and the handle on the paint roller, too. And, of course, indispensable nails and screws.

round the clock with

CF&I-WICKWIRE WIRE

9:30 P.M.—LIVING ROOM. Here, we see John relaxing in the comfort of his living room, where wire is used in many forms. Upholstery springs in his furniture. Wire in his TV set. Lampshade wire and picture cord wire. Even the screen in front of his fireplace is made of wire.

In our previous advertisements we have highlighted the importance of CF&I-Wickwire Wire in the daily life of John Q. Citizen. Here, at the end of a busy day, we find him returning home.

For the Wire You Require—
Check CF&I-Wickwire

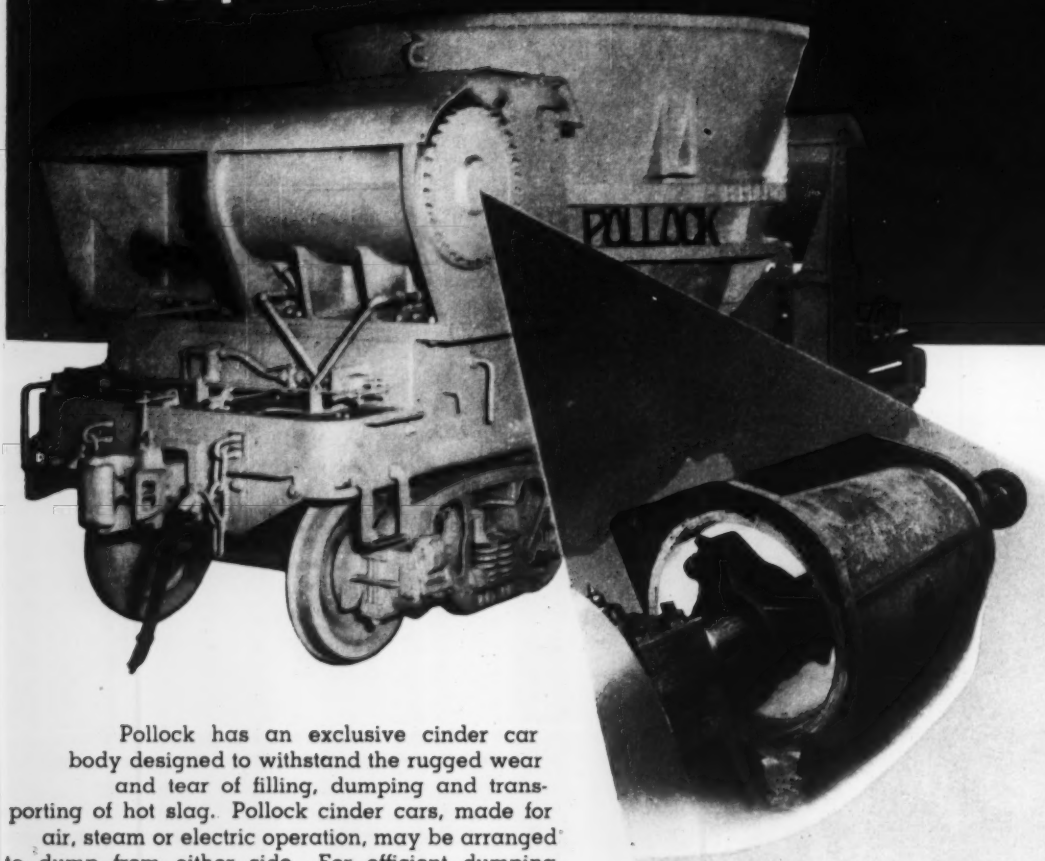
CF&I-WICKWIRE WIRE

THE COLORADO FUEL AND IRON CORPORATION

WICKWIRE SPENCER STEEL DIVISION—Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver • El Paso • Ft. Worth • Houston
Lincoln (Neb.) • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • Seattle • Spokane • Wichita

2737

meeting POLLOCK cinder cars "specs" requires POLLOCK special facilities



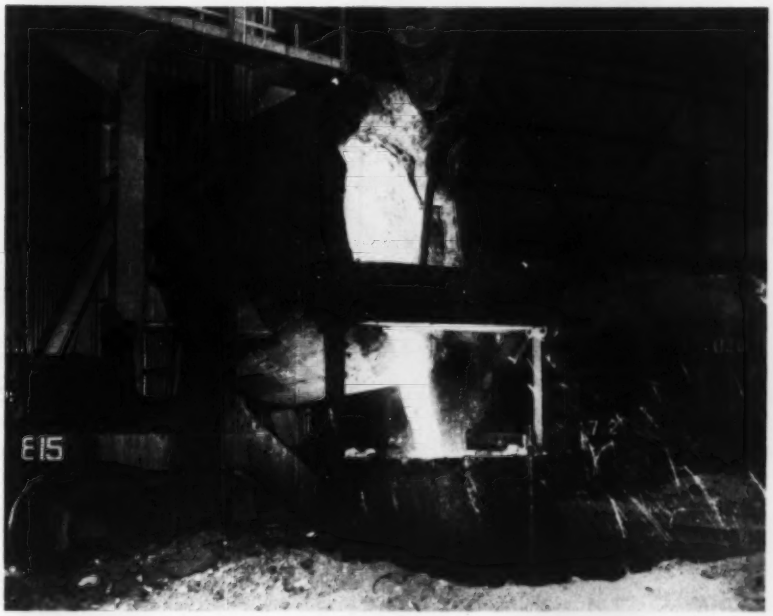
Pollock has an exclusive cinder car body designed to withstand the rugged wear and tear of filling, dumping and transporting of hot slag. Pollock cinder cars, made for air, steam or electric operation, may be arranged to dump from either side. For efficient dumping, Pollock cylinders provide ample power which results from close-tolerance boring and finishing on a special Pollock machine.

This is another example of where Pollock specifications are high because the company has special facilities to meet tough requirements. The major steel plants all over the world use Pollock cars, so why not have Pollock's expert engineers apply their experience to your cinder handling requirements.

This Pollock special machine will bore to close tolerances cylinders from 16 to 36 inches in diameter and up to 4½ feet long.

POLLOCK
Since 1863

THE WILLIAM B. POLLOCK COMPANY
YOUNGSTOWN, OHIO



Ingot mold supply improves as U. S. Steel completes . . .

Foundry Expansion at Edgar Thomson Works

INGOT MOLD capacity at United States Steel Corp.'s Edgar Thomson Works, Braddock, Pa., has been increased in product range and output. The extensive program started in 1953.

Capable of producing 275,000 tons of ingot molds annually, the foundry will supply U. S. Steel's basic steel mills in the Pittsburgh-Youngstown district and the Fairless Works, Fairless, Pa. The new facilities span the entire cycle of ingot mold production, from sand storage to finished casting. Operated entirely by electrical power and utilizing latest material handling equipment, the foundry is capable of making molds as high as 110 in., weighing up to 35 tons.

Casting Procedure—In the accompanying photo an electrically tilted 75-ton blast furnace ladle pours molten iron into a 20-ton casting ladle. Cranes transport casting ladles to one of three pouring stations, each accommodating 40 molds.

Preparation and transportation of sand in the foundry is a major production factor. A silica-base sand of superior heat-resistant characteristics is mixed with bentonite, a special bonding material. Belt conveyors move the sand to the foundry from bins housing 100 tons of new sand and 200 tons of reclaimed sand, with reserve space for 250 additional tons. Bucket elevators, feeders, screens, and other equipment complete the sand handling facilities.

The sand is packed into the patterns by sand slingers with such force that no manual ramming is needed. These mobile units, equipped with 20-ton tanks, can ram 1 million lb of sand a day. They move the entire length of the foundry on standard gage railroad tracks between four huge revolving turntables where the molds are prepared. Drying ovens can handle more than 1000 tons of molds daily.

Shakeout is done at two locations, both equipped with dust handling facilities which keep foundry dust to a minimum. Five dust collectors clean the dust laden air at 168,000 cfm. Sixteen exhaust fans, each moving 66,000 cfm, can change the air within the buildings 14 times an hour.

Ventilator Firm Expands

Donaldson Power Ventilator Co. enlarged its facilities at 11847 Vose St., North Hollywood, Calif. The company makes powered roof and wall ventilators.

Greenwell Buys Plating Firm

J. Robert Greenwell purchased Reliable Plating Corp., Chicago. Mr. Greenwell, formerly vice president of Chrome-Rite Co., that city, will be president and treasurer of Reliable; Joseph B. Becker, vice president.

Electromet To Build

Electro Metallurgical Co., division of Union Carbide & Carbon Corp., New York, will construct a chemical engineering research building in Niagara Falls, N. Y. It will cost more than $500,000.

IBM Opens Factory

International Business Machines Corp., New York, officially opened its 139,200-sq-ft plant in Endicott, N. Y. It is devoted to heat treating, plating and plastic molding. It will handle more than 40,000 different parts used in IBM electric accounting machines, electronic "brains" and time-recording instruments.

Will Move Casting Operations

Dayton Malleable Iron Co., Dayton, O., is moving its aluminum casting operations to Ironton, O. It represents the tag end of a larger operation which was transferred from the Dayton plant to Columbus, O., about a year ago.

Boiler Works Widens Market

Opening of new sales territories on the West Coast for the boiler industry in Oswego, N. Y., is being made possible by boat shipments. The announcement is made by Lewis Palm, president, Fulton Boiler Works Inc., one of several companies which recently moved to that city in response to Operation Oswego, a community industrial development organization. In selecting the site for its new plant, Fulton Boiler gave consideration to the development of the St. Lawrence Seaway and the Port of Central New York at Oswego.

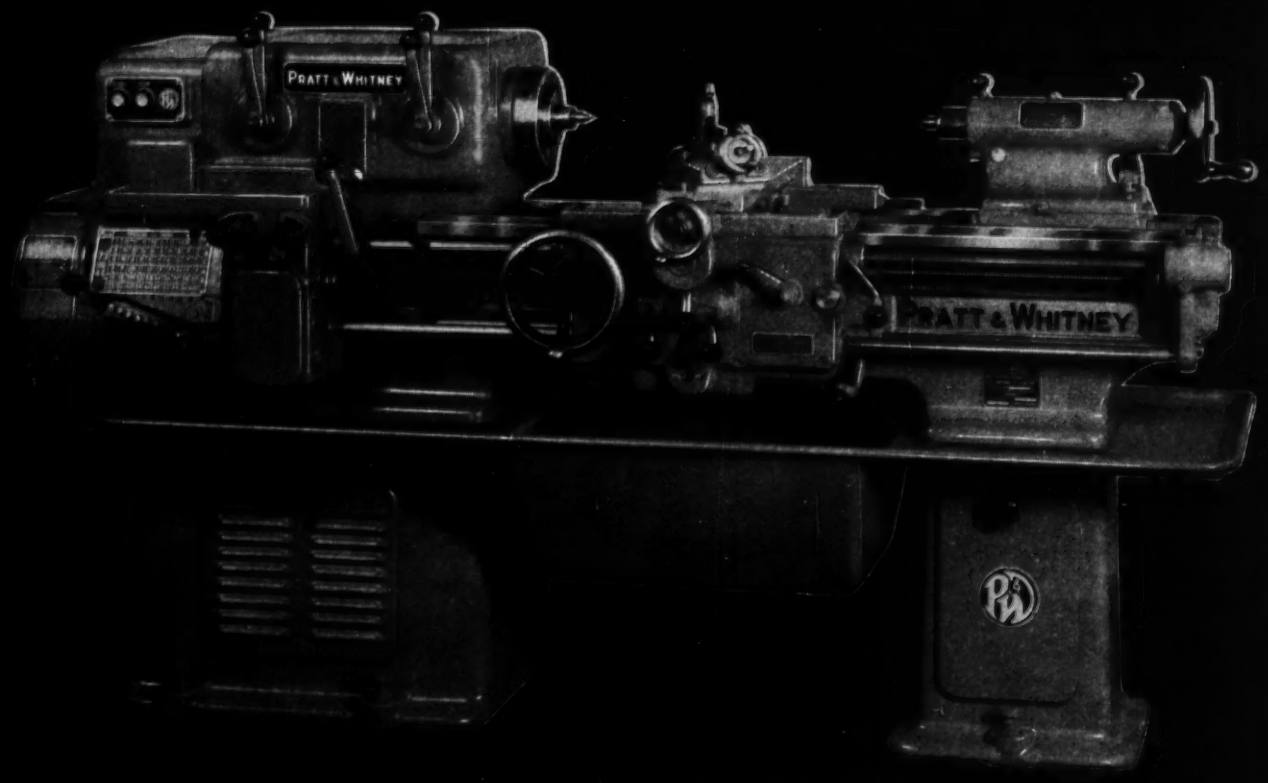
A survey of rail, truck and boat

(*Please turn to page* 89)

Traditionally the Finest...

PRATT & WHITNEY

Model "C" Lathes



12" and 16" SIZES IN STANDARD BED LENGTHS

PRATT & WHITNEY
DIVISION NILES-BEMENT-POND COMPANY
WEST HARTFORD 1, CONNECTICUT, U.S.A.
SINCE 1860

First Choice for Accuracy

MODERNIZE with PRATT & WHITNEY REPLACE FOR PROFIT

MACHINE TOOLS • CUTTING TOOLS • GAGES

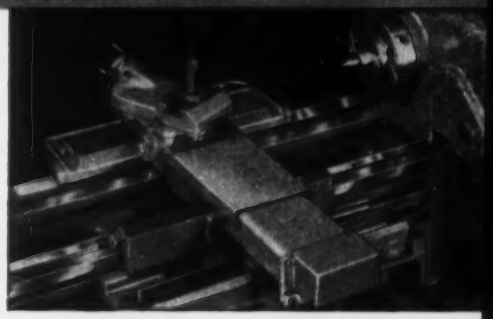
NOW... EVEN BETTER

Wherever "almost as good" isn't good enough, manufacturers throughout industry have traditionally relied on Pratt & Whitney Model "C" Lathes. Finest example of all that Pratt & Whitney stands for, the Model "C" makes it possible to establish and maintain the highest standards of tool room accuracy that are reflected in more efficient, more economical production and in improved product quality.

The standard by which all fine lathes are judged, Model "C" Lathes have always incorporated every detail of advanced design, carefully selected materials, skillful manufacture and rigid inspection that can contribute to precision performance and convenient operation.

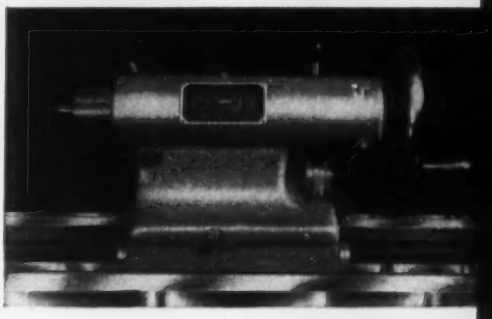
However, we at Pratt & Whitney believe that even the best can be made better . . . and we are proud to present the new Model "C" Lathes. Incorporating many important improvements, as well as a more modern appearance, they offer greater precision and convenience than any previous lathes.

Advanced Features



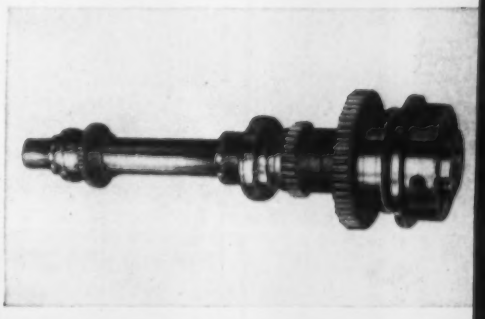
NEW BALL BEARING TAPER ATTACHMENT . . .

eliminates lost motion, backlash and friction. Smooth accurate tapers can be turned or bored even when taking exceptionally heavy cuts. Preloaded ball bearings in the taper bar shoe are mounted on eccentric studs to permit easy adjustment if required. Cross feed screw and all bearing surfaces are hardened and ground to assure long, accurate life.



COMPLETELY REDESIGNED TAILSTOCK . . .

is locked solidly in position on the bed by operating a single lever. This actuates two clamps simultaneously for either normal or very heavy work. New, spring loaded ball bearing mounting, supports nearly all the weight of the tailstock; when the binder is released, very little effort is required to move it on the bed. Spring bronze wipers at both ends of the tailstock base in contact with the bed at all times protect the accurately ground ways.



SUPER-PRECISION SPINDLE . . .

a beautiful piece of precision work. It is hollow to accommodate a draw-back . . . hardened and ground, and mounted at three points. The two front bearings, spaced closely to provide rigid front support, are preloaded super-precision ball bearings. The rear end bearing is of the anti-friction needle type.

HARDENED AND PRECISION GROUND BED WAYS . . .

give longer life with continued accuracy; they meet rigidly high P&W standards for parallelism, flatness, V formation, finish and hardness. The illustration shows a carriage way being tested; total end-to-end error must not exceed .0002" with the straightedge in several positions.

PRATT & WHITNEY

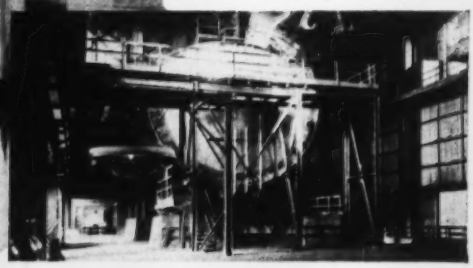
LATHES

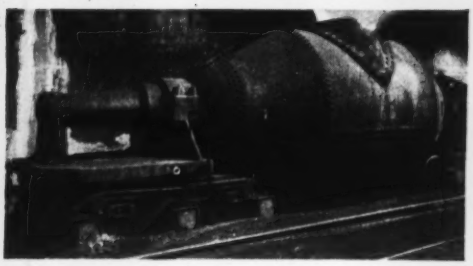
GIVE YOURSELF THE ADVANTAGE . . . EQUIP WITH THE NEWEST AND FINEST . . .

A. P. GREEN
KX-99

In...

Complete Blast Furnace Linings
Hot Metal Mixers
Hot Metal Cars





Resist Carbon Monoxide Disintegration... Slag Action... Chemical Action and Abrasion

Fifteen leading steel companies have proved KX-99 Blast Furnace Brick in service. KX-99 were developed to meet the service requirements in the Steel Industry and are recommended for Complete Blast Furnace Linings, Hot Metal Mixers and Hot Metal Cars.

Check These Outstanding Properties of KX-99

1. **Special high fired, Missouri super duty brick.**
2. **No sign of carbon monoxide disintegration in 1000 hour test at 900°F.**
3. **Apparent porosity in the range of 8 to 12 per cent with a average of 10 per cent.**
4. **Bulk density in the range of 2.30 to 2.40 grams per cubic centimeter.**
5. **Average modulus of rupture 1800 to 2500 pounds per square inch.**

For detailed information on service and specific recommendations—contact your local A. P. Green Representative or write

A. P. Green REFRACTORY PRODUCTS

KX-99 Blast Furnace Brick are manufactured to extremely close tolerances . . . uniform in dimensions . . . free from warpage.

A. P. GREEN FIRE BRICK COMPANY
Mexico, Missouri, U. S. A.
PLANTS: Mexico, Mo. • Woodbridge, N. J.
Sulphur Springs, Texas
In Canada:
A. P. GREEN FIRE BRICK COMPANY, LTD.
Toronto 15, Ontario

A COMPLETE LINE OF FIRE-CLAY REFRACTORIES

(*Concluded from page 85*)
shipping rates proved that only water rates will permit opening territories in the Far West.

Pacific Tube Co. Expands

Pacific Tube Co., Los Angeles, is doubling its stainless steel pickling capacity. The expansion project will cost about $200,000. The firm, maker of steel tubing and bars, expects to have the facilities in operation by mid-February.

Sylvania Enlarges Facilities

Sylvania Electric Products Inc., New York, completed installation of additional production facilities at its television picture tube division at Seneca Falls, N. Y. This makes possible output of an additional 25,000 large-size aluminized TV picture tubes a month. The division has 670,000 sq ft of manufacturing space.

Schick Building Plant

Schick Inc., Stamford, Conn., manufacturer of electric shavers, is building a plant in Lancaster, Pa. It is scheduled for completion in mid-1955.

Jarecki Firms Merge

Jarecki Machine & Tool Co. and Jarecki Products Inc., Grand Rapids, Mich., merged into Jarecki Corp. Clare F. Jarecki, president, says the merger is a natural combination because the machine and tool company is essentially a die and stamping concern, while the products firm operates a welding, metal fabrication, assembly and painting plant. The new firm will make dies, stampings and fabricated metal assemblies. Headquarters of Jarecki Corp. are at 320 Hall St., Grand Rapids.

Air Reduction Opens Plant

Air Reduction Sales Co., a division of Air Reduction Co. Inc., New York, officially opened its liquid oxygen plant at Riverton, N. J. Cost of the project, including extensive distribution facilities, was about $10 million. The plant will produce liquid and gaseous oxygen, nitrogen, argon and rare gases.

New Plating Service

Alco installs facilities for commercial application of chemical nickel-plating

AMERICAN LOCOMOTIVE CO., New York, has expanded facilities at its Dunkirk, N. Y., plant for commercial application of chemical nickel-plating. Introduced less than two years ago as a commercial process, company officials say the method promises significant savings to chemical, petroleum, power and other process companies troubled with contamination and corrosion in their production cycles.

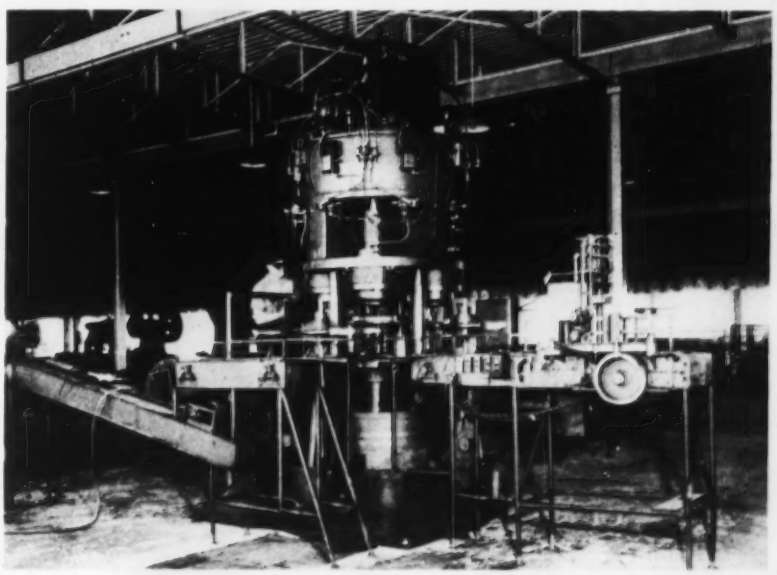
Called Alcoplate, the process is an adaptation of General American Transportation Corp.'s Kanigen process. Included in the term Alcoplate are important preplating and postplating operations established by Alco.

New Facilities — The Dunkirk production facilities are able to handle the Alcoplate process by two continuous-flow methods. The first is a closed cycle system used for internal coating and volume coating of similar-sized products. The second is an immersion process for both internal and external coating and plating product parts. Alco's equipment includes large cleaning vats; make-up, surge and regeneration tanks; and numerous pumps, heaters and evaporators. All are lined with glass and linked with glass piping since the plating solution will deposit nickel on all but glass surfaces.

So convinced is Alco of the future of the process that it has built two laboratories to conduct chemical analysis, micro and macro analysis, and physical testing. The laboratories are equipped with heat-treating facilities, machine tools for preparing specimens and delicate instruments for conducting research and quality control tests.

American Locomotive Co. also has concluded negotiations for the acquisition of Central Pipe Fabricating & Supply Co., Cincinnati. This places the company in a position to offer a full line of prefabricated pipe. Alco's plants in Dunkirk and Beaumont, Tex., produce heat exchangers, pressure vessels, water pipe, flanges and allied equipment.

The Cincinnati plant has a monthly capacity of about 200 tons of prefabricated process and power piping, ranging in size from

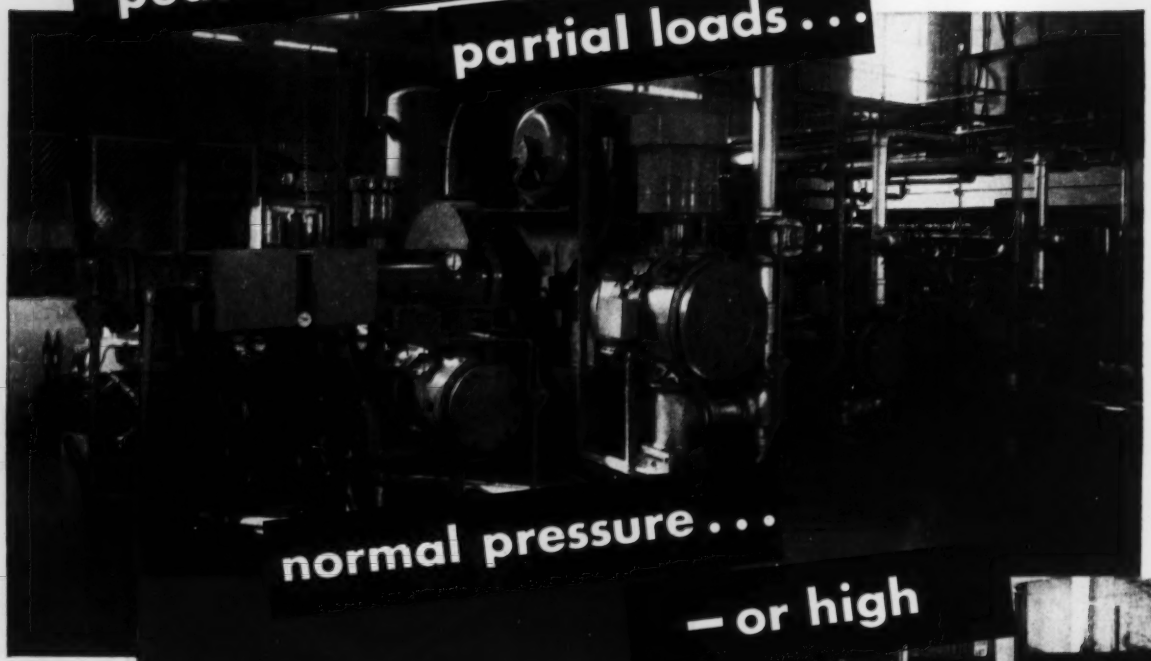


Jones & Laughlin Readies New Container Plant

Getting set for the opening of Jones & Laughlin Steel Corp.'s new combination warehouse-container plant at Lancaster, Pa., a mechanic goes over a swaging machine on the pail line. This machine will curl and bead the lips on the five-gallon and three and one-half gallon steel shipping pails manufactured at the plant. J&L's new facility was scheduled to go into production early this month

peak loads . . .

partial loads . . .



normal pressure . . .

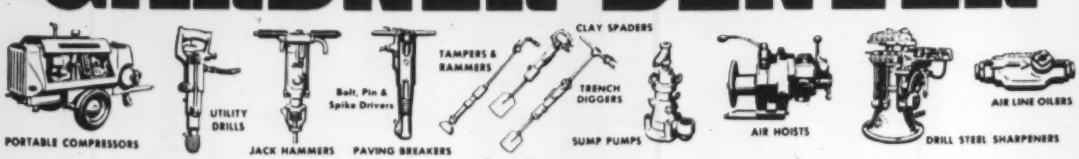
— or high

a GARDNER-DENVER COMPRESSOR for every need!

. . . this Chicago manufacturer meets *all* compressed air needs with this efficient installation of *seven* Gardner-Denver Compressors.

SINCE 1859

GARDNER-DENVER



THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Ill. In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ont.

2½ up to 24 in. The new owner plans immediate improvement and expansion of present facilities. Manufacturing space is to be increased, machine tools and heat treating equipment installed and a railroad siding constructed.

Koch Buys Buffalo Concern

Zahm & Nagel Co. Inc., Buffalo, brewery equipment maker, has been purchased by Victor E. Koch, owner of Koch Metal Spinning Co. The building housing both firms will be enlarged.

Plans Utah Ammonia Plant

Blaw-Knox Co., Pittsburgh, is nearing completion on the engineering design of a 200-ton-per-day ammonia plant to be built by United States Steel Corp. at its Geneva, Utah, plant. Construction is scheduled to begin early in 1955. Coke oven gas produced at Geneva will be used as hydrogen source for the ammonia plant.

Disston Opens Los Angeles Office

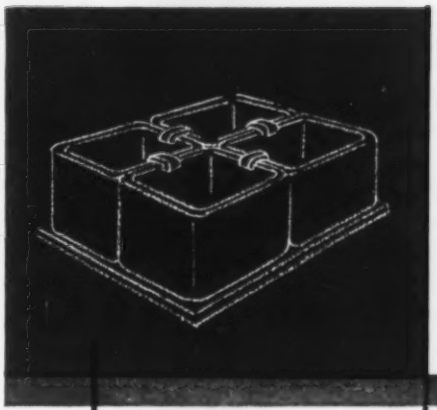
Henry Disston & Sons Inc., Philadelphia, established a warehouse and office at 403 E. Washington Blvd., Los Angeles. Under the supervision of Harold Spurgeon, it stocks industrial products for cutting wood and metal.

Army Forms Weapons Command

The Department of the Army will establish on Jan. 1 an Ordnance Weapons Command with headquarters at Rock Island, Ill. It will include the Rock Island arsenal, the Watertown arsenal at Watertown, Mass. and the Springfield Armory at Springfield, Mass. The command will be responsible for weapons ranging from pistols to heavy artillery. It will be responsible for direction of development, procurement, production, maintenance and major aspects of supply management.

Dow Buys Versenes Inc.

Dow Chemical Co., Midland, Mich., purchased Versenes Inc., Framingham, Mass., manufacturer of chemical specialties known as chelating agents. Acquisition of



HOLCROFT and the BATCH FURNACE

More Jobs . . . Faster . . . at a Lower Cost

The batch furnace permits you to handle a large variety of jobs—it can be completely automated for faster production—and can deliver volume production at a low, low cost.

For example, in the furnace shown below you can anneal, temper, clean harden, carbon restore, carburize or carbonitride entirely automatically.

In a batch furnace, the entire work load is positioned inside the chamber and is removed after the heat treat cycle has been completed. Batch furnace may have several stock handling methods: tray, car, cover, elevator, pit, and tumbling barrel depending on the type of stock treated.

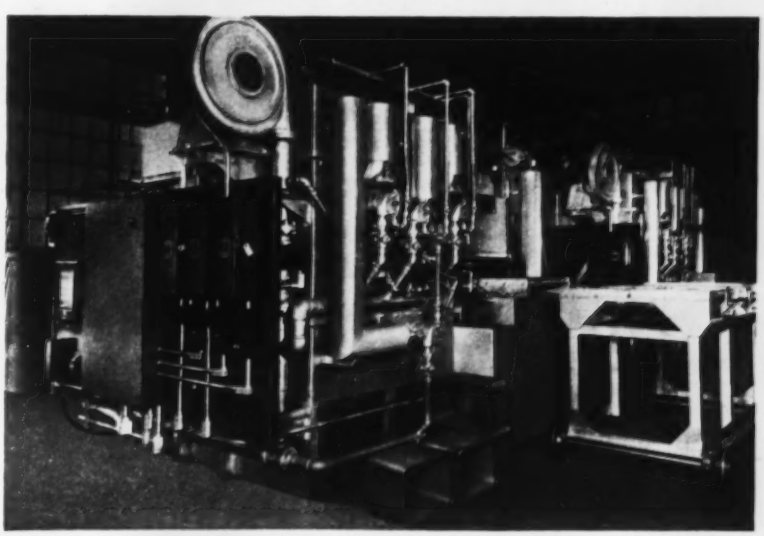
Just as great a variety of stock handling methods pop up when furnaces are continuous, that is where successive loads parade through heat treat cycle. You will find a complete description of all types of continuous furnaces and their methods of handling stock in Holcroft's book—Blazing the Heat Treat Trail. You can have a copy if you write today. Holcroft & Company, 6545 Epworth Blvd., Detroit 10, Mich.

HOLCROFT & COMPANY DETROIT

PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

CHICAGO, ILL. CLEVELAND, OHIO HOUSTON, TEXAS PHILADELPHIA, PA.

CANADA: Walker Metal Products, Ltd., Windsor, Ontario EUROPE: S.O.F.I.M. Paris 8, France



"FORGED STEEL CAN DO SO MANY JOBS SO WELL"

Flats • Rounds • Squares • Hexagons

Special Shapes & Prototype Forgings

FURNISHED IN

Aircraft, Alloy, Stainless, & Carbon Steels

	Thick	Wide	Long
FLATS	¼"	¾"-4"	8 ft.
	⅜"	½"-6"	10 ft.
	½"	⅝"-6"	10 ft.
	⅝"-⅞"	¾"-10"	12 ft.
	1"-1¼"	1⅛"-10"	12 ft.
	1⅜"-1¾"	1½"-10"	16 ft.
	1⅞"-3"	2"-12"	16 ft.
	3⅛"-5"	3¼"-16"	16 ft.

ROUNDS ○ ½"-12"

SQUARES ½"-12"

HEXAGONS ½"-5"

Max. Bar Wgt. 5000 lbs.
Max. Bar Lgt. 20 ft.

Ends Cold Sawed

All steel smooth forged to standard forging tolerances ★ Complete facilities in our own plant for rough turning and rough boring ★ Heat treating facilities for bars max. length 20 ft.

McINNES STEEL COMPANY

SINCE 1895

MILL: CORRY, PENNSYLVANIA

Offices in all principal cities

this firm will enable Dow to further diversify its product line, says Dr. Leland I. Doan, president. Dr. F. C. Bersworth, president of Versenes Inc., becomes a Dow research consultant, while Frank Kottek, Versenes treasurer and general manager, continues as production manager at Framingham, where manufacturing operations will be maintained.

Honeywell Buys Doelcam Corp.

Minneapolis - Honeywell Regulator Co., Minneapolis, purchased Doelcam Corp., Boston, maker of precision instruments and control equipment for aircraft and industrial uses. It will be operated as a Honeywell division.

Pennsalt To Buy Camden Firm

Pennsylvania Salt Mfg. Co., Philadelphia, will acquire I. P. Thomas & Son Co., Camden, N. J., subject to approval by stockholders. A Thomas-developed water conditioning agent is expected to have useful application in Pennsalt's lines of industrial detergents, metal cleaners and dairy cleansers. The Camden firm is prominently identified with the fertilizer field. Additional facilities for sulphuric acid production also are included. They fit into Pennsalt's plans for larger markets in the growing Delaware Valley industrial area.

Boeing Awards Subcontracts

Ryan Aeronautical Co., San Diego, Calif., is tooling for production of major fuselage sections for America's first jet tanker-transport, the Boeing KC-135. The firm will also build an important unit of the plane's flight controls system. The initial release on the assembly order is for about $3 million. Ryan's Boeing subcontract program on the KC-97 Stratofreighter totals about $50 million, with a backlog of more than $10 million in undelivered orders currently in work.

Under other major subcontracts Rohr Aircraft Corp., Riverside, Calif., will build engine struts and pods and the horizontal stabilizer and elevator assemblies; Twin Coach Co., Aircraft Division, Buf-

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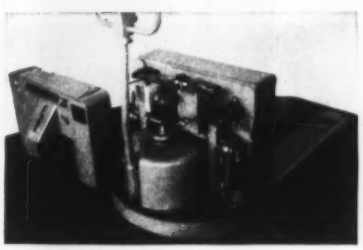
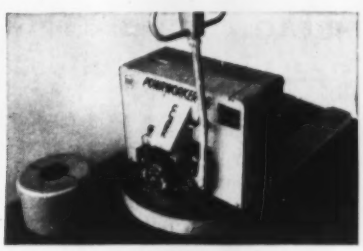


HYDRAULIC SYSTEM EXPOSED IN 2 MINUTES . . .

Remove 4 bolts and slip off the one-piece cover; the complete hydraulic sub-assembly is exposed. Hydraulic motor, pump, oil reservoir, valve assembly and self-aligning cylinders are immediately accessible and ample space is provided for quick inspection or removal.



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Over 1000 HEX STYLES produced

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CHECK FISCHER! Find out if your special isn't a "standard". You'll find it pays! For either way, regular or custom production, you can't match the **HIGH PRECISION, LOW PRICE** and **POSITIVE DELIVERY** of "Fischer Turned" Brass Nuts. Our prices and samples will prove it. Send today!

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Western Union—TFI-BELL SYSTEM TELETYPEWRITER CI-448-U.
TELEPHONE Woodburn 1280

falo, will supply vertical fin and rudder units; Bendix Aviation Corp., South Bend, Ind., will build the main landing gear units; Menasco Mfg. Co., Burbank, Calif., will make the nose gear assemblies.

Lawlor and Boller Merge

S. C. Lawlor Co. and Peter Boller Machine Works, separate but affiliated companies under the same management, have been merged and will operate as S. C. Lawlor Co. Officers of the new firm are: W. G. Ashton, president; G. E. Kerber, secretary-treasurer. Arthur Boller continues as director and F. Lally as sales secretary. The company makes floor maintenance equipment.

ASSOCIATIONS

D. T. Wellman, president of Wellman Bronze & Aluminum Co., Cleveland, was elected president of **Magnesium Association,** New York. James E. Pepall, president of Magnesium Co. of Canada Ltd., was elected vice president; J. V. Cosman, president, Superior Bearing Bronze Co., was re-elected treasurer. Jerry Singleton and Miss Martha I. Hansen will continue as executive secretary and assistant secretary, respectively.

Jervis C. Webb, president of Jervis B. Webb Co., Detroit, was elected president of **Conveyor Equipment Manufacturers Association,** Washington. Other officers are F. S. Wells, Stephens-Adamson Mfg. Co., Aurora, Ill., vice president; E. E. Boberg, Standard Conveyor Co., North St. Paul, Minn., treasurer; R. B. Maas, Screw Conveyor Corp., Hammond, Ind., secretary.

American Society for Metals, Cleveland, elected W. H. Eisenman for the 19th consecutive two-year term as its secretary. In his annual report, he made these recommendations: Erection of an adequate new headquarters building; creation of a division to be known as Metal Engineering Institute; creation of a division to

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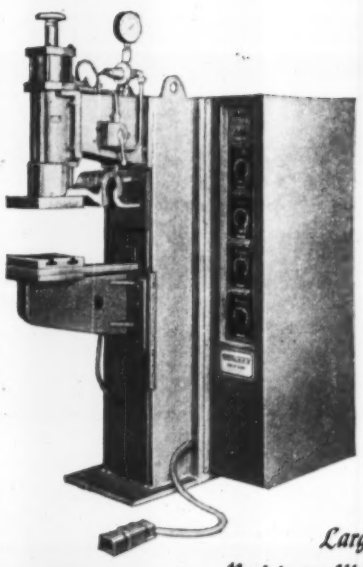

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- **Sciaky High Efficiency Welding Transformer**
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• In the new No. 120 Speed Reducer Catalog, BRAD FOOTE helps you choose the reducer you need from single, double or triple reduction parallel shaft, and double and triple reduction right angle types. It's as easy as A, B, C.

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be known as ASM Metallurgical Seminars; creation of a division to be known as ASM Metal Research Laboratory; creation of a division to be known as Metal Science University.

Henry G. Riter III was elected president of **National Association of Manufacturers,** New York. He is chairman of the board, Copperweld Steel Co., Glassport, Pa., and

HENRY G. RITER III
. . . president of NAM

serves on its executive committee. He also is president of Thomas A. Edison Inc., West Orange, N. J., and a limited partner in Riter & Co., New York. He is vice president, director and a member of the executive committee of New Jersey State Chamber of Commerce.

NEW ADDRESSES

Russell A. Johnson, divisional sales manager for refrigeration components of **Houdaille-Hershey Corp.,** Detroit, established his headquarters at the firm's Refrigeration Division plant at North Chicago, Ill. Eric Boehm is manager of this division. Mr. Johnson assists in the centralization of all refrigeration sales and engineering activities in connection with evaporators, condensers, cabinet cooling plates and freezer shelves being manufactured at the North Chicago plant.

Unsurpassed-anywhere!

IT ALL COMES DOWN to one fact... that you can always count on Roebling high carbon flat spring steel to reduce preparation time, machine stoppages and rejects to a minimum. What's more, it's made as you want it... annealed, hard rolled untempered; scaleless tempered; tempered and polished, blued or strawed.

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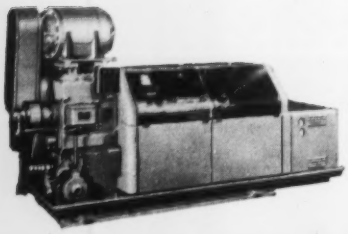

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AUTOMATIC THREAD & FORM GRINDERS • OPTICAL COMPARATORS • AUTOMATIC OPENING THREADING DIES & CHASERS

STEEL

December 13, 1954

Technical Outlook

MORE USES— Look for vinyl coatings extruded over metal tubing to take a more prominent place in manufacture of furniture. It's already used for table and chair legs, outdoor furniture, Bell Telephone operator's chairs. Other places it's found: Bus grab rails and luggage racks. Opaque rigid vinyls, transparent or tinted colors on tubing are all in the picture.

LESS CORROSION— The Red Lead Technical Committee after several years of test work on many experimental coatings) has issued formulations giving best protection. Red lead paints serve as active anticorrosion coatings for rusted or weathered galvanized surfaces or as protective coatings for properly pretreated new galvanized steel.

SWALLOW NOISE— Bedlam from rivet and nail heading machines dipped to comfortable conversation level when concrete block building walls were faced with sound material. Facing consists of 2 in. thick glass fiber board protected from damage by perforated aluminum siding. A plastic membrane between the siding and fiber board prevents the board from absorbing oil mist, yet transmits sound. Installation is in Alcoa's new plant at Lancaster, Pa.

NEW SPECS— Standard requirements covering electrodes for welding nickel and nickel-base alloys to themselves and steel have been issued jointly by American Welding Society and ASTM.

STEP-UP OPERATION— Investment in automation usually makes downtime a costly proposition. John D. Rumsey, chief engineer, Jervis B. Webb Co., Detroit, suggests that predictable downtime such as changing tools, cleaning and the like can be kept to a minimum by scheduling necessary services to be carried out during lunch hours or on shifts when the production department is down. Nonpredictable downtime, he says, is usually due to poor design and may be eliminated by making equipment simple and rugged and by safety mechanisms to prevent abuse and misuse.

GROWING UP— With the development of bigger presses, some of the powder metallurgy people envision the possibility of pressing 100 lb motor blocks from powders.

PROOF OF TESTS— There's new evidence that short time laboratory creep tests simulate service conditions. Rates of creep in two carbon-molybdenum steel steam pipes after 100,000 hours of service at 900°F is 0.002 per cent per 1000 hours under operating stress of 7500 psi. This checks laboratory findings. Work was done by Detroit Edison Co. and University of Michigan.

FLOOR BARRIER— In multistory building, a strong floor provides the best natural barrier to fire's usual upward progress. Open-web steel joists soon fail in fire unless they are protected. National Bureau of Standards recommends a 1-in. plaster ceiling on gypsum lath attached to the truss chords as effective protection. Plaster over 1 in. thick gives no additional benefit.

MEASURES HYDROGEN— The vacuum heating method is used by British Cast Iron Research Association to determine hydrogen in cast iron. Hydrogen is estimated by measuring the change in pressure on one side of a palladium thimble. Researchers at the association say that at room temperature hydrogen may be evolved continuously from cast iron up to 200 days.

Metalworking Outlook—p. 49 *Market Outlook—p. 143*

That hissing sound is money running out your pipes. Tighter oversize air distribution systems are smart insurance for future growth

Where Compressed Air Is Used

Abrasive tools
Air hoists
Core blowing
Boiler tube cleaning
Air chucks and air vises
Lubricating guns and systems
Hand drills, reamers
Door opening and closing mechanisms
Paint spray guns
Drying
Dusting
Forge air
Pneumatic tube systems
Bessemer converters
Bulk conveying systems
Engine starters
Belt shifters
Adhesive curing
Air gages
Clocks
Percussion tools
Presses
Forges
Screwdrivers and nut runners
Blast furnaces
Ejection devices
Air brakes
Rotating mechanisms
Reciprocating mechanisms
Pumps
Whistles and sirens
Caulking
Agitating and stirring
Blast cleaning
Vibrating mechanisms
Dry-pipe sprinkler systems
Safety devices
Open hearth furnaces

Compressed Air for

WHEN ENGINEERS design a plant they urge, "build in enough power capacity to handle future needs." Compressed air people fervently add, "Amen."

They ought to know. So often complaints about air tools and compressors that aren't doing their rated work turn out to be faults of the air distribution system instead.

Foresight Pays—Foresight when the air system was installed would have been a lot cheaper than the cure. It's one thing to order a bigger compressor, and quite another to rebuild an entire distribution system.

Where do you find the crystal ball to predict the air capacity you'll need ten years from now? Admittedly, there's guess work involved, but here, in lieu of crystal ball, are some partial answers.

How Much Growth?—Engineers have come up with a 35 per cent growth factor based on experience as adequate for planning future air needs. That's 35 per cent more than your present compressed air demand. If your use of air is anywhere near standard for your type of operation, and your growth pattern is steady, then the figure is appropriate. If you're experiencing rapid growth, then the estimate may be on the low side.

Starting point in planning is how you use air. A survey will turn up surprises. You'll find you use air in a lot of ways you didn't realize and will discover a lot of ways you could use it profitably but don't. How do you check out against the accompanying list which is far from exhaustive?

Figure Your Needs—Any sort of planning must also take into account the time during which air equipment operates, since it all doesn't work at the same time or continuously. When air requirements and operating time for each

HOW TO DETERMINE AIR REQUIREMENTS

Type of tool	Where used	(A) No. of tools	(B) Load factor (% of time tools used)	Cfm free air needed (C) Per tool when in use	Total if all tools used at once	Total used AxBxC
Blowguns, chucks, vises	Machine shop					25
8-in. grinders	Cleaning	10	50%	35	350	175
Chippers	Cleaning	10	50%	30	300	150
Hoists	Cleaning	2	10%	35	70	7
Small screwdrivers	Assembly	20	25%	12	240	60
Large nut setters	Assembly	2	25%	30	60	15
Wood borer	Shipping	1	25%	30	30	7½
Screwdriver	Shipping	1	25%	30	30	7½
Hoist	Shipping	1	20%	40	40	8
Total		47			1120	455
Plus the 35% growth factor						159 cfm
Minimum compressor capacity for present and future needs (Provided distribution is adequate)						614 cfm

Expanded Use

By VAN CALDWELL
Assistant Editor

use are known, then it's a fairly simple matter to determine total air requirements. The table above shows how.

There's one big kicker to remember when figuring air requirements by the method shown in the table: The answer you get is cfm of air needed at the using end. It's a measure of compressor size only so long as compressor output will get through to the users. The whole distribution system—pipes, valves, fittings and hoses—has to be big enough.

Leaks Cost Plenty—And it has to be tight. A single 1/16-in. hole in a hose wastes over $10 worth of air a month, and systems where leakage exceeds 10 per cent of air carried are common. In contrast, the fuel gas industry won't tolerate leakage of over 1 cfm per mile of 3-in. line. That isn't the worst of it. Leakage means lowered tool efficiency, and that's money wasted, too.

There's a moral, of course: If you know your compressor is big enough, but your tools aren't getting enough air, check the system for leaks and keep it checked. Most likely locations for small leaks are around valve stems, in hose connections, unions, drains, homemade blowguns and in lines leading to inoperative tools.

Distribution Checkpoints — In setting up an air distribution system, here are a number of points to remember that will pay off later:

1. Pipe sizes should be large enough so that pressure drop between receiver and point of use does not exceed 10 per cent of initial pressure. Oversize piping is a wise investment.

2. Where possible, use a loop system around the plant and within each shop and building. This gives two-way distribution to the point where air demand is greatest.

3. Long distribution lines should have liberal receivers near the far ends or at points of heavy use. Many peak demands for compressed air are of short duration and storage capacity near such points avoids excessive drop.

4. Each header or main should have outlets as close as possible to point of use. That permits shorter hoses. (Friction in long hoses is one of the biggest wasters of pressure, sometimes dropping it as much as 25 per cent.) Hose inside diameter including fittings should never be under the recommended size for each tool.

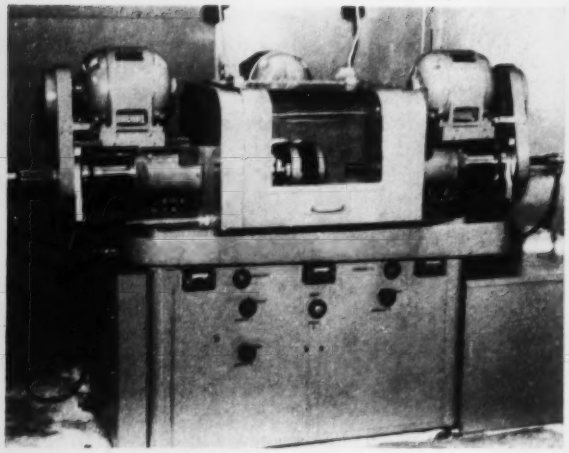
Use an air gage with hypodermic needle attachment to check air pressure at tools while they are running. The hole the needle pricks in the air hose is self-closing.

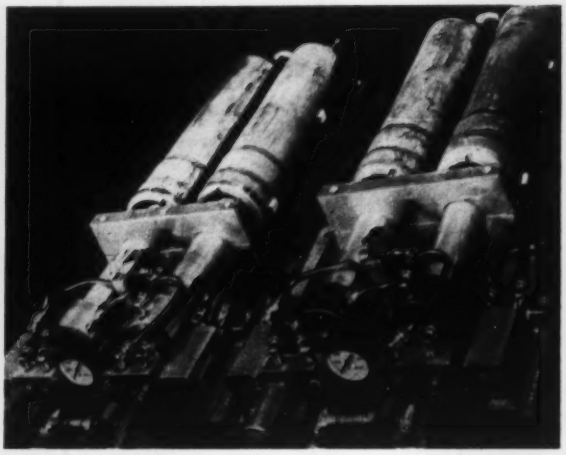
5. Piping should slope toward a drop leg or moisture trap to prevent moisture from being carried into tools. Slope of air lines should always be away from the compressor to prevent condensate from draining back into the compressor chamber. Hose outlets should be on top of the pipe line to prevent carry-over of condensed moisture to the tool.

Water Hazard — Emphasis on dry air is important. Moisture causes water hammer, reduces air capacity, washes away tool lubricants and freezes in cold weather. Various devices such as aftercoolers and moisture traps will get rid of it. It's equally important to filter air entering the compressors to keep out dirt.

If you're ready for study of your compressed air situation, a good place to start is the *Compressed Air Handbook* compiled by the Compressed Air & Gas Institute. The second edition came off the presses a few weeks ago.

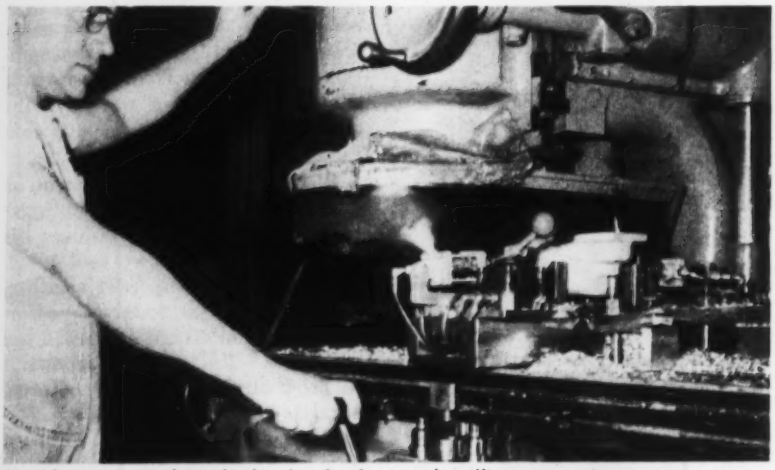
For what one company did with air, turn the page



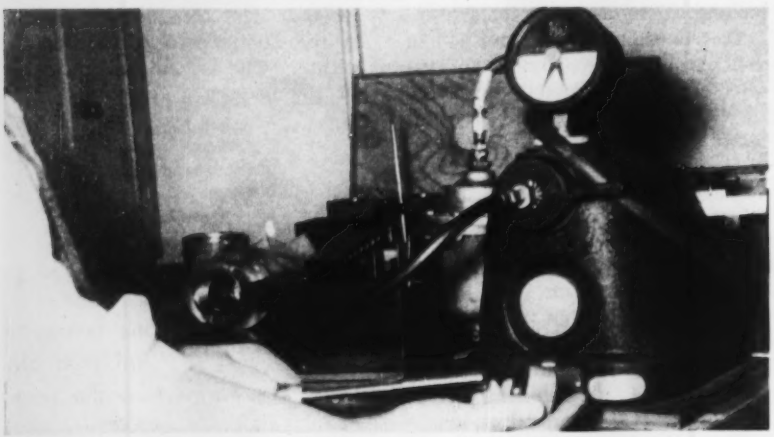


High-production machine developed at Vard Inc. for precision boring of aircraft components. Air boosts oil cylinders for feed and rapid traverse. Spindles move rapidly to the work and then slow down to cutting speed. Dwelling time at end of cut may be controlled. Tool backs cut on rapid traverse. At right, air control mechanism of spindle feeds. Cycle is a push-button operation with micro switches setting speeds

Their System Held Air To Spare



Air clamping and air-hydraulic feeds speed milling operation



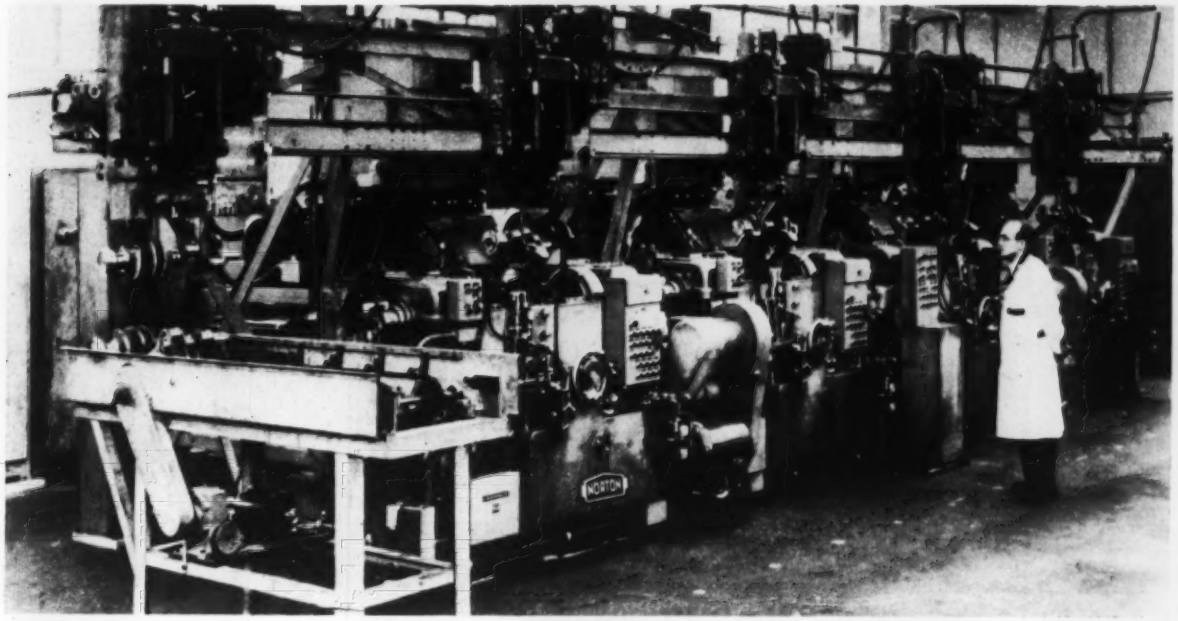
Air gage is typical example of efficient use of compressed air

VARD INC. found a bonanza in its pipes — air power that wasn't working.

The Pasadena, Calif., company had built a machine to bore aircraft components to 0.0002-in. tolerances. On the original machine the boring spindles were fed and returned by a hydraulic system. Then the company struck air. Now air taken off the plant line at 100 psi eliminates three electric motors and pumps on revised versions of the machine and boosts oil cylinders for the feed. Air clamps hold the work, too.

For Milling Too — The same principle was put to work on a heavy duty milling machine. Feed is hydraulically actuated by compressed air pushing against oil, eliminating the need for a hydraulic pump. Work is air-clamped to save time in loading and unloading the machine.

The air system at Vard was originally installed for routine applications—air impact wrenches and drills, air grinders, squeezers and sandblasting in the foundry and spray painting. But it was built-in extra capacity that made air available for positive lubrication of bearings, air gages, quick loading devices for high-speed lathe work and economies in the design of production machines.



Cranks picked up from conveyor (left) pass through four stations. Machine senses completion of a cycle by checking work diameter

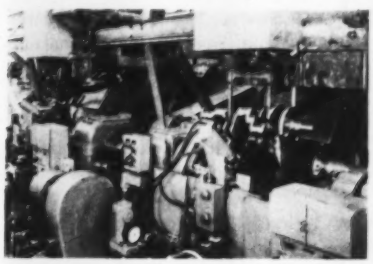
Mechanized Crankpin Grinding

This transfer grinder adjusts, grinds, gages and transfers automatically. It will complete a shaft a minute. Assembled, the machine weighs 140,000 lb, occupies 1000 sq ft of floor space

CAN AN OPERATION as intricate and exacting as grinding a crankpin be done with automated machines?

Engineers at Norton Co. asked that question while studying the motions and practices of skilled workmen on conventional machines.

Answer — The outcome was a machine design with several automatic features—such as handling of the crankshaft, radial and longitudinal orientation of the crankpin, sizing control from the work diameter and control of the grinding action that is related to wheel truing. Wheel speed, wheel wear compensation and diamond wear were also taken into consideration.



Closeup view of one of the 4 grinding stations which are used during setting up. Air snap gage controls size

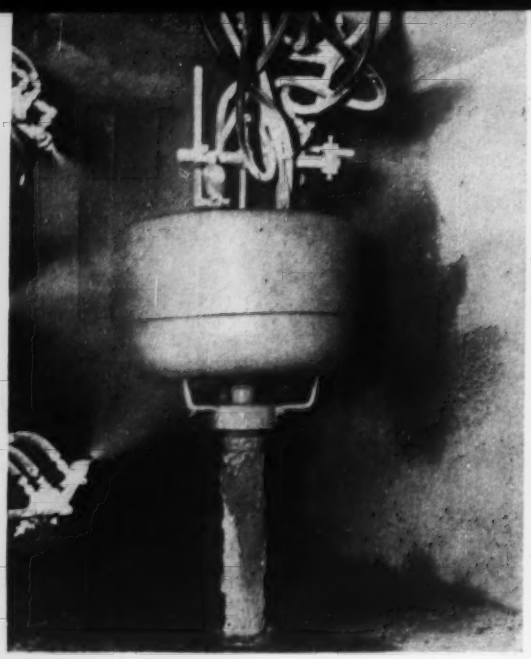
The machine is basically a four-station, four-wheel machine for V-8 crankshafts. It is arranged to pick up crankshafts from a conveyor line or loading station and transfer them into the machine for grinding. Five transfer heads operate simultaneously. They take an unground shaft from the loading station for grinding pin number 2; a crank from the second to third grinding station for grinding pin number three; a crank from the third to fourth for grinding pin number four; and a finished crankshaft from number four to the unloading station.

Positioning—Each transfer station contains a locating hook for rough orienting a shaft angularly. A rotating cam locates it longitudinally in front of the grinding wheel and a locating pin engages a hole in the crankshaft flange for final angular location.

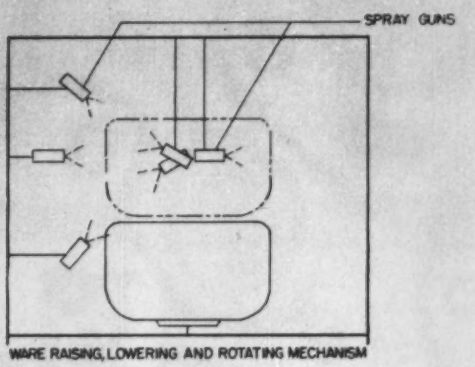
Because the machine is automatic, a central station controls the functions of each station.

Driving power of the first model totals 139 hp. Lubrication is automatic, with oil being fed from a central lubricating system to the wheel slide, ways and other moving parts. Truing can be actuated at each cycle or any preset number of cycles. Wear is automatically compensated for by the machine.

Wheel slide motion can be controlled to produce work diameters under automatic control by air-snap gages within a tolerance of plus or minus 0.0002 in.



Washer tub spray machine: Spray guns are mounted on booth walls. Tub raising, lowering and rotating mechanism is located in a pit under the booth



Automation Plugs Loophole in Enameling Costs

Methods of porcelain enamel application still offer plenty of room for improvement. Enamelers are trying automatic spraying machines to cut costs, improve products

PORCELAIN ENAMEL has an answer to the inroads of competing finishes and rising production costs. It's automation.

With the merits of porcelain enamel finishes well established, the problem is to keep them cost-competitive. Study of the enameling process has turned up a promising area for improvement.

Critical Step—Five major steps in the process are metal preparation, enamel preparation, enamel application, drying and firing. In modern plants automatic machines now perform most of these steps.

Getting the hand labor out of enamel application, where it still is strongly entrenched, looks like the cost-cutting answer, Robert S. Hlivak, Ferro Corp., Cleveland, told delegates in a paper delivered before the Shop Practice Forum of the Porcelain Enamel Institute, held at Urbana, Ill., Sept. 8. Several firms have come up with ways and means.

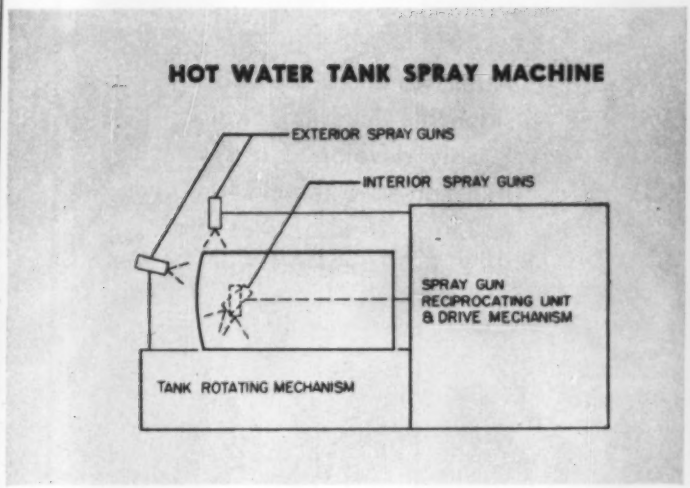
Mechanical Spraying — Ferro Corp., has developed semiautomatic machines for applying enamel to washing machine tubs and hot water tank shells. The first is a fixture that rotates the tub before a battery of conventional automatic spray guns, which simultaneously spray its inside and outside surfaces. The fixture is mounted on an air-operated raising and lowering mechanism. Tubs are loaded and removed when the fixture is in the lowered position clear of the guns.

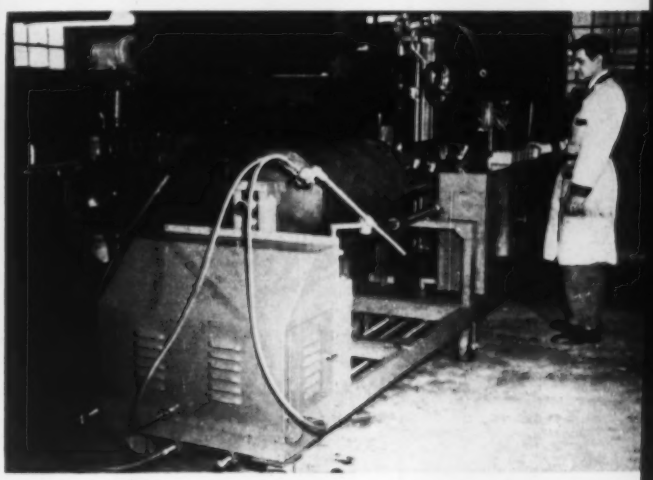
The spray guns are mounted in a bench-type spray booth, considered an integral part of the machine. Installation cost is low. Besides the usual compressed air, electric current and water lines, the only requirement is a pit about 4 ft wide, 6 ft long and 1½ ft deep in the floor beneath the spray booth. It houses the raising and lowering mechanism.

Tank Shells Too—The machine for applying ground coat enamel to the interior of hot water tank shells consists of a tank rotating mechanism, a battery of automatic spray guns and a horizontal reciprocating unit to which the guns are fastened. Tanks are loaded and unloaded by hand while the guns are retracted. As the tank rotates, the guns move in and out on the reciprocating units.

The trial model at Heintz Mfg.

Hot water tank spray machine: Guns for spraying walls of tank are mounted on mechanism that reciprocates horizontally while tank rotates. Exterior spray guns apply a dust coat that minimizes scaling during firing


HOT WATER TANK SPRAY MACHINE
EXTERIOR SPRAY GUNS
INTERIOR SPRAY GUNS
SPRAY GUN RECIPROCATING UNIT & DRIVE MECHANISM
TANK ROTATING MECHANISM



Co., Philadelphia, was mounted on casters to make it completely portable. It can be used in an existing spray booth. Modifications of this machine, currently being installed at Rheem Mfg. Co.'s Chicago plant, will spray two tanks at once and will be loaded and unloaded by a horizontal conveyor, making them completely automatic.

Many Advantages—Both types of machines have demonstrated the advantages of automatic machinery: Increased production, improved quality, reduced rejects and savings in material. The tub sprayer, with two men to operate it, is turning out 240 tubs an hour. They are of better quality than the 200 per hour that five men turned out by hand spraying. The tank sprayer is producing excellent ware with one-man operation at a rate better than 120 tanks per hour.

While the use of horizontal reciprocating spraying machinery is by no means new in the porcelain enamel industry, it has been used mostly for flat ware. Now it moves into the hollow ware field and raises the question of vertical reciprocating spraying machinery.

Up and Down—Porcelain enamelers have stayed away from vertical reciprocating machines. Their fluid pressure fluctuations make enamel thickness control a problem. But why not use vertical machines to apply ground coat where thickness is not critical, one manufacturer asks.

He is trying bathtub spraying, using 4 vertical machines mounted in tandem on 6-ft centers along an overhead monorail conveyor. Tests indicate that 6 out of 7 hand sprays formerly needed to apply ground coat to pressed steel bath tubs could be eliminated. A full production line using vertical machines will be in production shortly. The method is also being extended to automatically spray ground coat enamel on hot water tank flues.

High Potential — Still another technique being tried by porcelain enamelers is electrostatic spraying, M. L. Pouilly of Illinois Spray & Equipment Co., Harvey, Ill., pointed out in another paper delivered at the PEI Shop Practice Forum. Clyde Porcelain Steel Division of the Whirlpool Corp., Clyde, O., has installed electrostatic equipment on a pilot line for spraying washer tops. This line has proved capable of spraying 240 washer tops per hour with 75 per cent savings in enamel slip and more uniform film thickness than was possible with hand spraying.

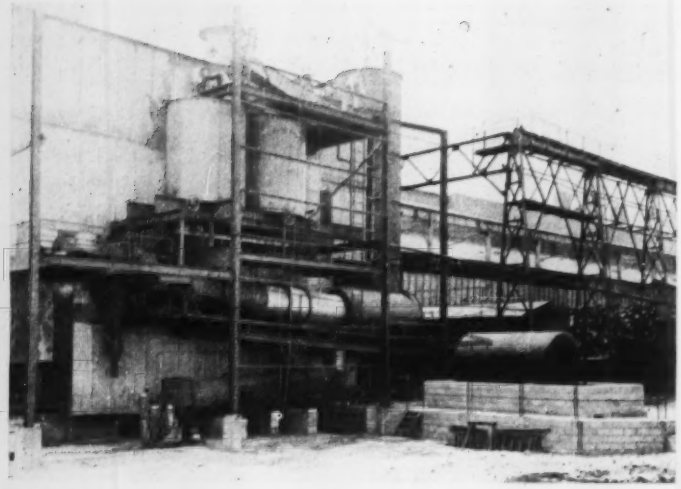
The line was set up with two spraying stations, one using four and the other three guns. The guns have special air caps for electrostatic spraying, fluid nozzles with small orifice and individual atomization air control. They are turned on and off automatically.

The installation employs electrostatic spray equipment manufactured by Scientific Electric Co., Garfield, N. J.

Some Changes Made—Electrostatic spraying requires a finer frit, but longer grinding time is more than compensated for by savings in material. Changes needed in grind, sets and mill formulation are not extreme.

Most electrostatic spraying of porcelain has been with the finish coat where the smooth texture obtained tends to emphasize imperfections in the ground coat. Thus improved ground coat finishes are of prime importance and electrostatic spraying is being tried for them as well.

Added Savings — Material saving features of electrospraying porcelain enamel aren't the only advantages. Spray booth facial air velocity can be lowered from the 175 cfm region to around 60 cfm, and since there is little overspray, booth maintenance and spray reclaiming problems are minimized.



Three tons of molding sand can be reclaimed every hour in this wet reclamation setup at National Supply's Torrance Calif., plant

After two years' use and considerable tinkering, National Supply developed a system that can save them $40,000 a year. It also frees area tied up in sand storage

They're Making Sand Reclamation Pay

RECLAIMING steel foundry molding sands is a profitable venture at National Supply Co.'s Torrance, Calif., plant.

In fact, they've developed a wet sand reclamation process to the point where it figures to save the company about $40,000 a year—based on casting production of 400 tons a month. Investment over the two-year period it took to get the project going: $55,000.

Molding sand used in casting production comes from the reclaimer. New sand—1120 lb a ton of castings—is added to the core sand to replenish handling losses and sand removed through shot blast and dust collection. The process also means reduction of the quantity of new sand in storage and minimizes dangers from delay in new sand delivery.

Initial Setup—The first installation—3 tons an hour capacity—was completed in 1952. In this setup, used sand is fed by belt conveyor into two sand scrubbers. Then the water-entrained sand is pumped to a classifier to eliminate water and slime overflow waste. The classifier moves it on into temporary storage tanks.

To complete the mechanized process, another conveyor—this one a belt type—moves under the tanks carrying the wet sand to a dryer. It goes from the dryer through a cooling unit and over a vibrating screen to storage bins.

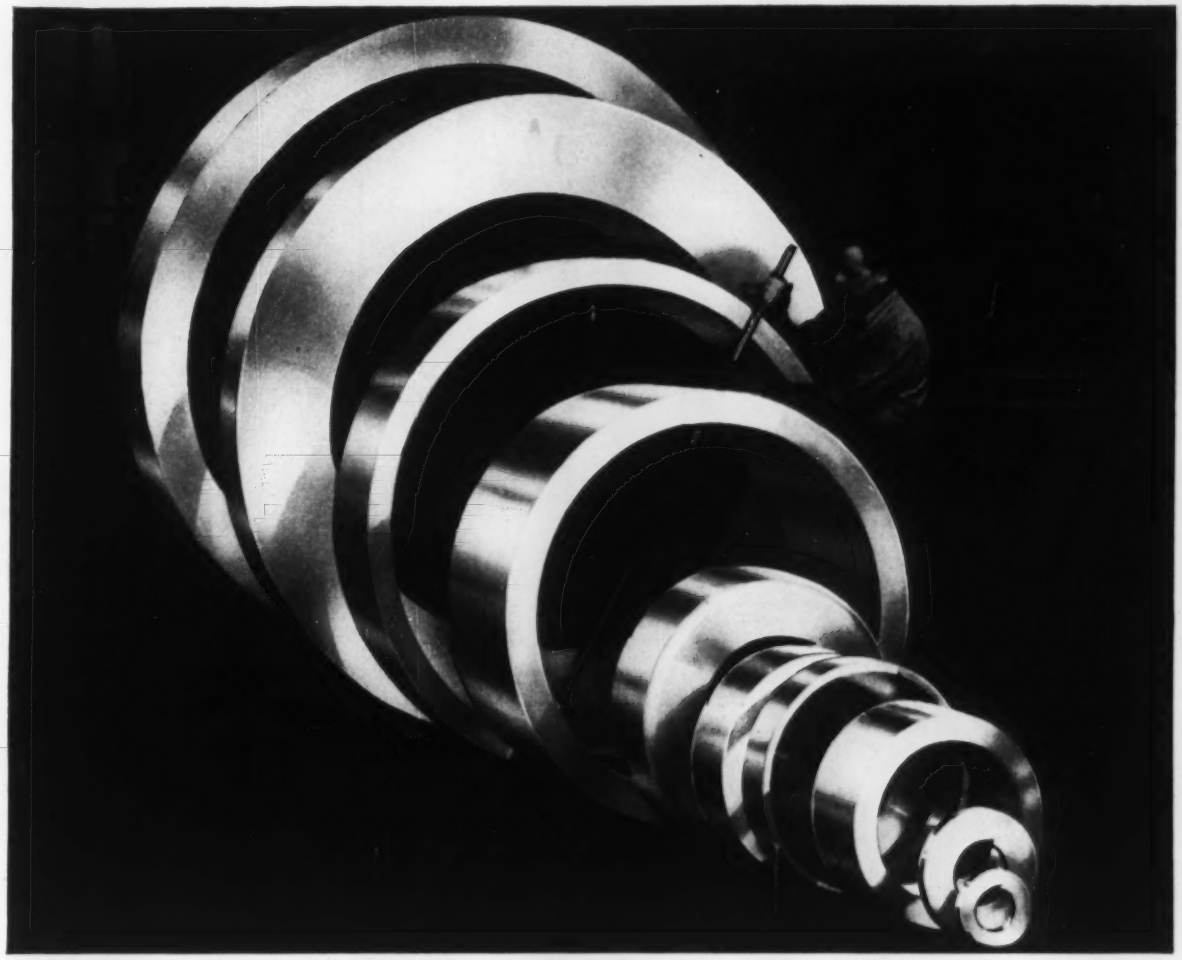
Refinements — Around this framework, they made several changes to get satisfactory results. First to go was calcining, with its 1100°F heat requirement. Firing temperature was dropped from 1500 to 400°F. Without calcining, sand carbon content has not exceeded 0.11 per cent.

Water fog or mist cut temperatures in the cooler even further. This was done simply by using water pipe riddled with fine holes. Water introduced this way doesn't wet the sand. Another change: The original rake classifier was replaced by a screw conveyor to reduce the amount of water carried into the hoppers. Overnight storage also cuts down water content to about 10 to 12 per cent.

Desirable Changes—Some other suggestions, based on National Supply's experience, should be helpful if you're thinking of a similar setup. The company is convinced a filtering unit would be more satisfactory than the hoppers for separating the water before heat drying. They figure its cost at about $5000, but add that it would eliminate extra labor now required to shovel sand clinging to hopper walls when emptied.

TABLE I
MOLDING SAND COSTS

	New Sand	New	Reclaimed Sand
Sand per ton	$ 2.85		$1.87
Freight per ton	11.60		
Total cost per ton	14.45	$14.45	1.87
Tons of sand used per ton of casting	x 1.2	x .56	x .64
Cost of sand per ton of casting	17.34	8.09	1.20
Cost of handling sand per ton of casting	1.63	.75	....
Total cost of sand per ton of casting	$18.97	8.84	1.20
Total cost of new and reclaimed sand			$10.04
Savings per ton of castings			8.93
Savings per year at 400 tons per month			$42,864



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Each Midvale ring is exact in metallurgical specifications because of the experienced steel making practices and complete open hearth and electric furnace facilities of Midvale. Rings are carefully shaped by craftsmen with years of forging and rolling skill. Heat treated in temperature controlled furnaces to assure wearing qualities that will withstand the severest friction, abrasive, crushing and grinding action.

This is why Midvale rings are noted for their long life . . . why gear makers order Midvale blanks . . . why Midvale rings and roll shells are used on the toughest installations. The men of Midvale working with the right equipment and facilities offer you a source of rings, rolls and forgings unsurpassed in quality and extra performance.

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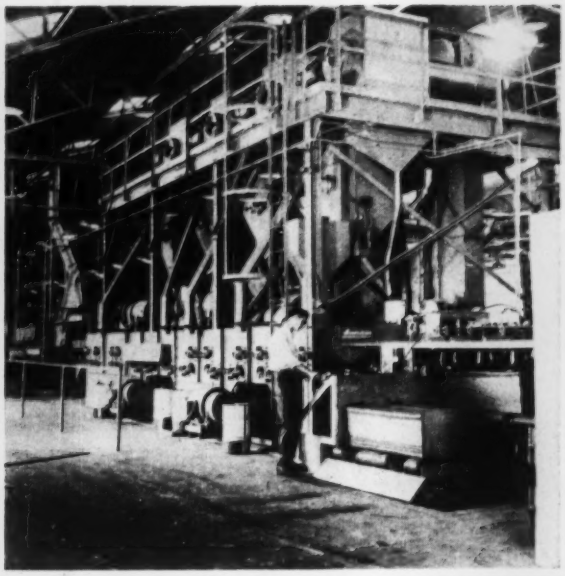
Sheets 0.078 to 0.250 in. thick are cleaned before forming into water heater shells at A. O. Smith, Kankakee, Ill.



Continuous line at Rheem descales 16 and 18-gage sheets in an 8-wheel machine. Sheets are later formed into drums

MILL TREND—
More Jobs for Mechanical Descaling

Number of applications has mushroomed in the last five years. Elimination of pickling is only part of the reason. Mechanical cleaning aids workability

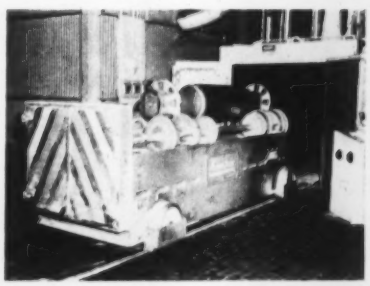
By C. R. CLINE
Assistant to the President
American Wheelabrator & Equipment Corp.
Mishawaka, Ind.

SUCCESS in key applications of the airless, mechanical descaling process points the way to a new era in the descaling and processing of steel. Pickling requirements are greatly reduced or even eliminated. With respect to sheets and strip, plain hot rolled steel can be used where hot rolled pickled and oiled were necessary.

Mechanically cleaned metal is found to cold roll, cold draw and in general work better than material that is only pickled. The process saves steel by not removing any of the virgin metal and by making it possible to recover all of the scale removed. Abrasive consumed in the removal of scale is also recovered.

Advantages — Besides reducing or eliminating acid and the problem of its disposal, mechanical equipment requires only a fraction of the floor area needed by the chemical method of cleaning. Of particular value to the processor is the fact that there are no operational expenses when the blast cleaner is shut down. Steel mill operators can either eliminate chemical cleaning or add the mechanical cleaner to a pickling line and reduce the amount of chemical cleaning performed.

To clean, metallic abrasive is hurled from a series of rotating bladed wheels mounted within the cabinet. Blast wheels rotate at speeds near 2250 rpm and throw the abrasive directionally by means of centrifugal force alone. Various types of conveyors are



Fairless Works gets uniform roll etch in this mechanical blaster

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Morgan Cranes in capacities from 5 tons to the largest loads have been quality engineered since 1868. They incorporate the principles of Morganization... the design, engineering, building, and servicing of Morgan Cranes, Rolling Mills, and special heavy machinery to serve you years longer at lower annual maintenance cost.

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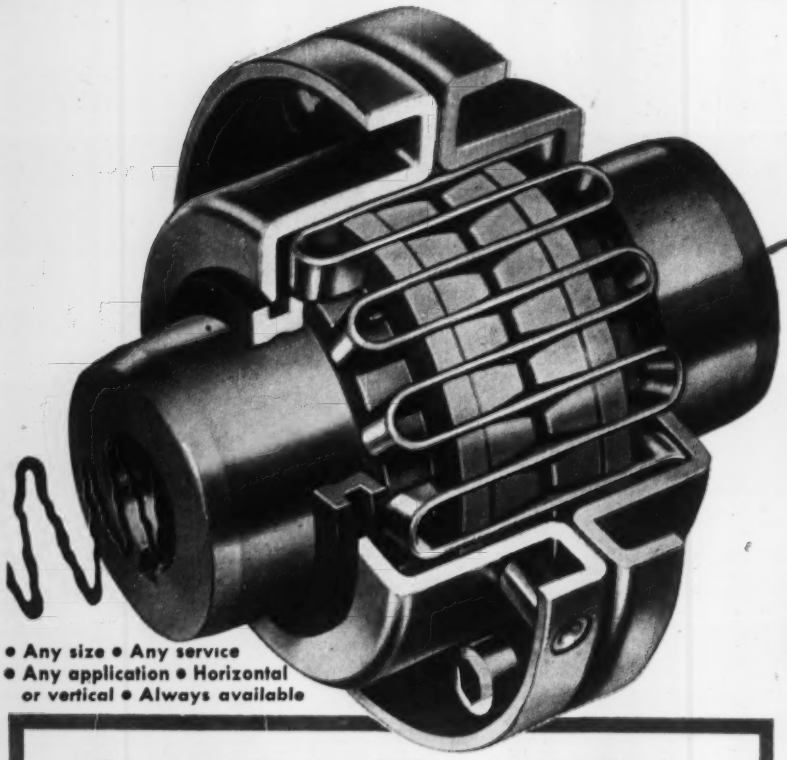
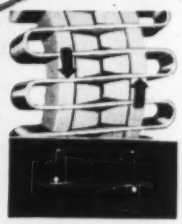


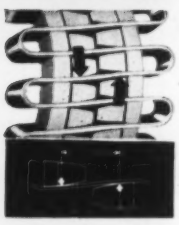
• Any size • Any service
• Any application • Horizontal or vertical • Always available

Exclusive FALK Steelflex grid-groove design smothers shock and vibration.

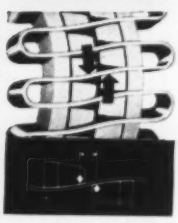
The damaging effects of shock and vibration can shorten the life of any connected machinery. Here is how the Steelflex grid-groove design overcomes these common enemies.



Under LIGHT LOADS
The gridmember bears only at outer edges of grooves. The long span between points of contact remains free to flex under load variations.



Under NORMAL LOADS
As load increases, the distance between supports on the grooves is shortened proportionately, but a free span remains to cushion shock loads.



Under SHOCK LOADS
Under extreme overloads, the grid-member bears fully on the grooves and transmits full load directly. The coupling remains flexible, within its rated capacity.

Why FALK Steelflex Couplings give the *finest* protection for connected machinery

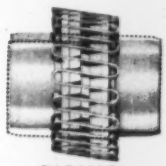
Maximum protection of connected machinery is best provided by Falk Steelflex Couplings because, thanks to their exclusive design, they overcome the damaging conditions of shock loads, shaft misalignment and vibration. How this unique multiple protection is made possible is shown at the right.

Falk Steelflex Couplings give the most economical protection, too, because they make connected machinery last longer and give better service. Furthermore, when actual coupling costs are figured per year of service, Falk Steelflex Couplings show substantial savings through their rugged all-steel construction, easy interchangeability and low maintenance requirements.

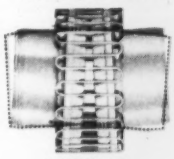
The basic Type F Steelflex Coupling—in 33 sizes to cover capacities from 2/5 through 70,000 hp per 100 rpm—meets over 90% of all industrial applications. Special or Dual Purpose Steelflex Couplings are available for problem applications. Write to Department 247 for engineering bulletin, including selection and dimension details.

...Accommodates shaft misalignment and free end float

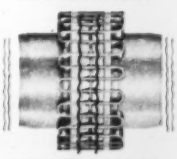
Basic maintenance procedure dictates regular inspection and correction of shaft alignment. Between inspections, Steelflex couplings provide protection by accommodating unavoidable shaft misalignment and end float. The gridmember which connects the two hubs of a Steelflex coupling is not fastened to either hub, so each hub can shift without imposing load on the other shaft.



PARALLEL MISALIGNMENT



ANGULAR MISALIGNMENT



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used to transport the work through the blasting zone.

Strip cleaning cabinets have been built with as many as 16 wheels, for cleaning speeds of about 250 lineal fpm, but even more wheels and faster speeds are being planned. Flat stock from 20 to 60 in. in width and 0.43 to 1 in. thick is being cleaned. New installations are planned where coiled flat stock up to 94 in. in width will be cleaned. Even wider widths of plate will be handled.

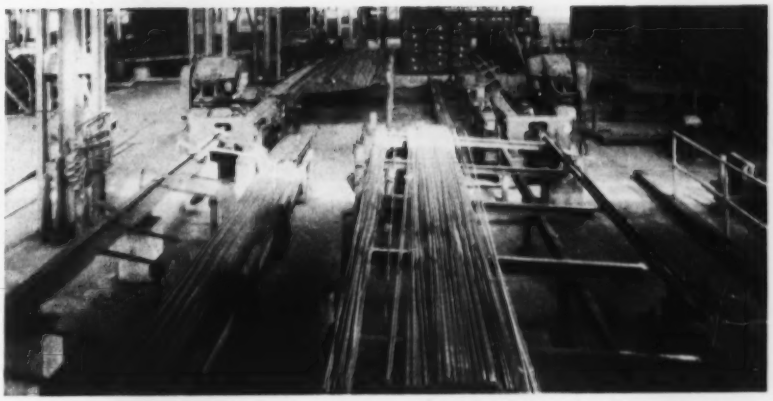
Case Studies — Seven plants of Rheem Mfg. Co. use mechanical descalers for steel sheets rather than pickling in the manufacture of their "Rheemcote" drums. Each Wheelabrator line produces about 20 tons per hour of 16 and 18 gage cleaned and phosphate coated.

Total cost of cleaning and phosphate coating sheets in these process lines is $2.85 to $3 per ton, including labor and all fixed charges. This compares to an over-all acid pickling cost of about $5 per ton. The actual airless blasting cost alone is 92 cents.

Stainless Line — Washington Steel Corp., Washington, Pa., cleans annealed straight chrome and chrome nickel alloy strip before acid passivation and cold rolling. (see STEEL, Feb. 16, 1953, p. 86) Rate for 36¾-in. wide chrome nickel strip is 15 to 25 fpm. Chrome alloy strip is handled at 7½ fpm. Scale breaking has been eliminated. The cleaning process is carried out in a continuous line, in conjunction with the annealing furnace.

Columbia Steel & Shafting Co., Carnegie, Pa., uses the mechanical process to clean hot rolled bar stock. A machine with two abrasive hurling wheels is used. Mechanical blasting plus a 5-minute acid pickling does the job. Their pickling time was reduced from 30 minutes to only 5.

Coming Soon—What will probably be the largest machine ever put into production will soon be cleaning 24 to 54-in. carbon steel strip at 250 fpm. Installation is at Empire Steel Co., Mansfield, O. The 16-wheel machine will hurl 1000 lb of abrasive per minute and will be followed by a 60-ft acid tank as secondary cleaner. Cost of descaling is estimated at 46 cents per ton.



At Sharon Tube Co., Sharon, Pa., two straighteners are positioned at rear of two parallel lines that form a U pattern

CONTINUOUS STRAIGHTENING

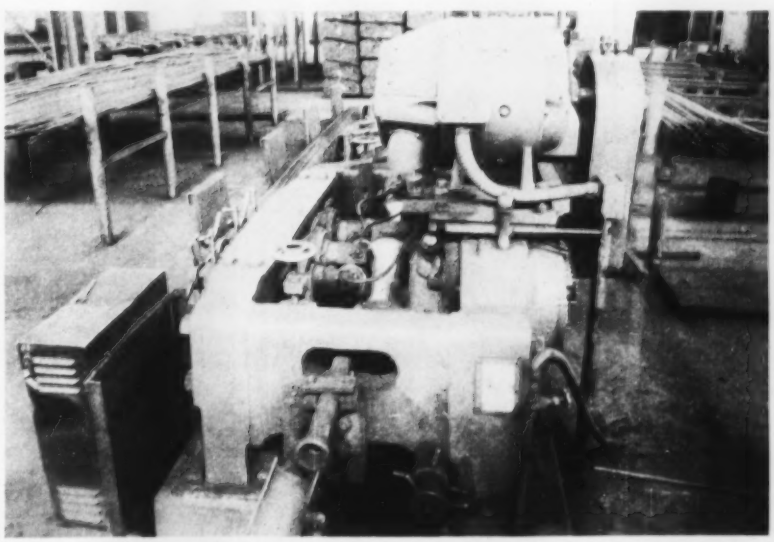
No Bottlenecks in Pipe Finishing

KEEPING a continuous buttweld mill continuous can generate some tough production problems. Sharon Tube Co. does the job with a pair of Sutton straighteners that have functioned without a hitch since their installation two years ago.

Each of Sharon's straighteners can handle about 1000 twenty-one-foot sections of pipe an hour. The continuous mill turns out 2000 twenty-one-foot sections an hour, so the straighteners must function at top speed and with a minimum of maintenance to avoid a bottleneck in the finishing department.

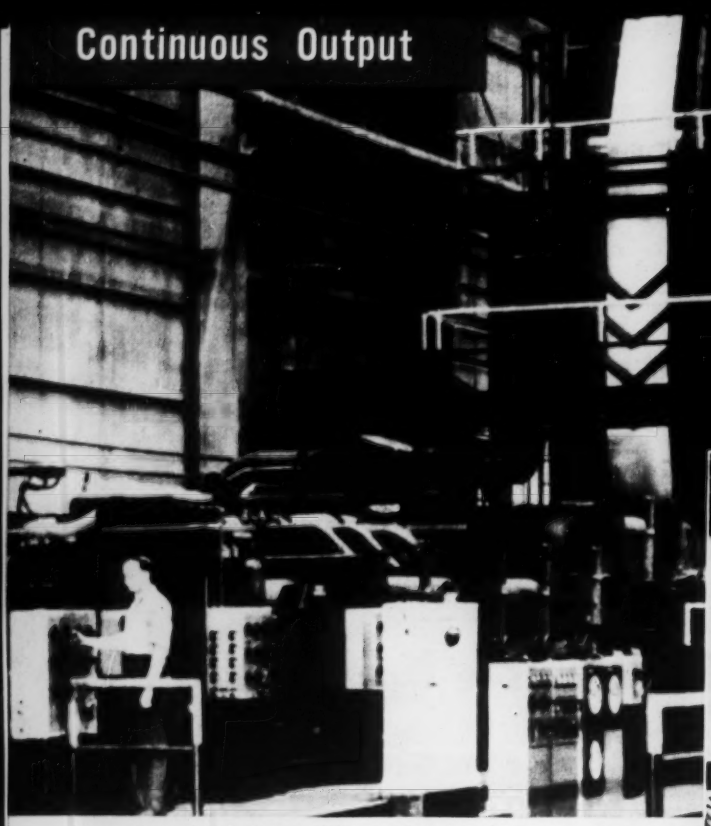
All pipe produced by the firm can go through its straightener department, Sharon reports. This includes welded tube, black and galvanized.

As it emerges from the buttweld mill, pipe is cut into specified lengths by a rotary hot saw. After passing through a sizing mill, pipe is transferred to storage racks for complete cooling. Overnight cooling is the last step before it's fed manually into the straighteners.



Close-up of a five-roll straightener shows positioning of rolls in horizontal pass line. Builder is Sutton Engineering Co.

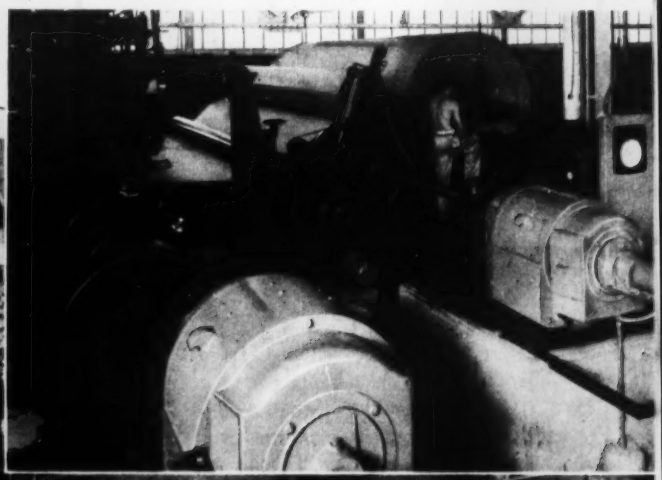
Continuous Output

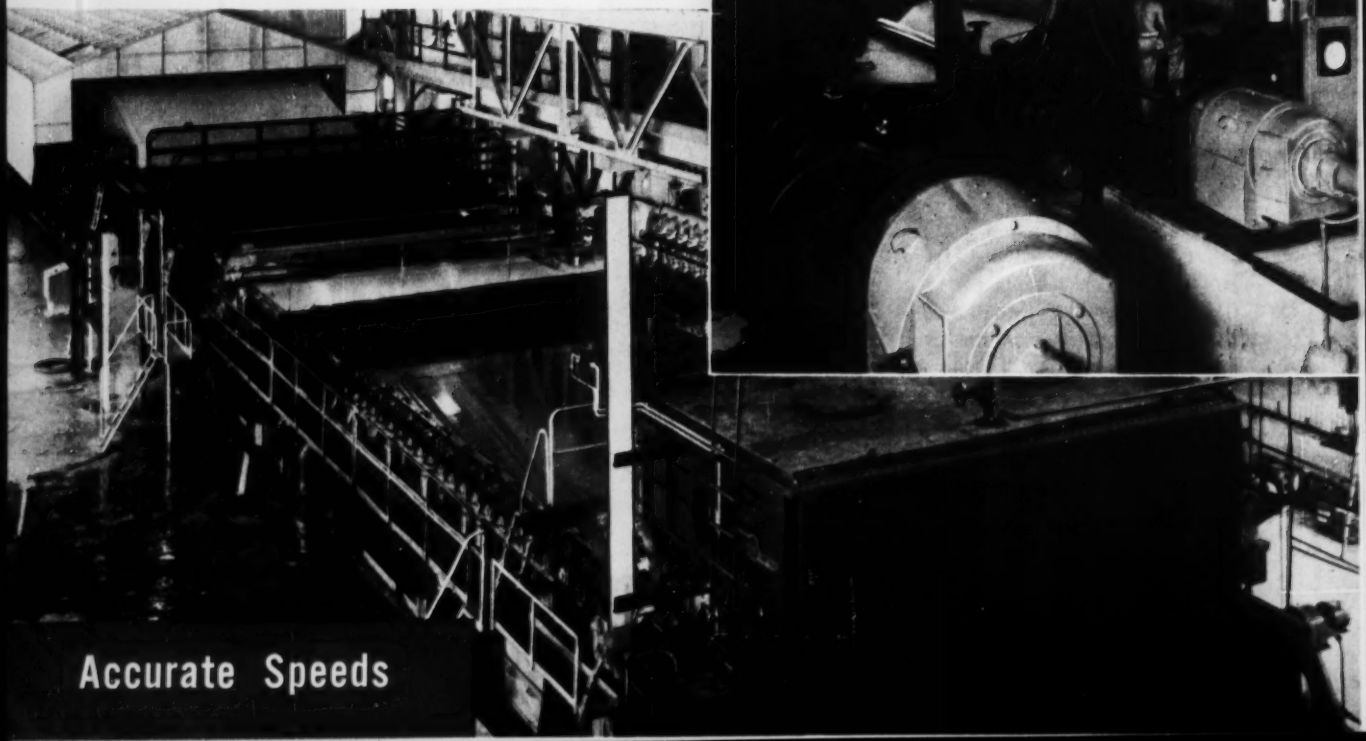


Co-ordinated G-E drive and furnace help produce up to 30 tons/hour of annealed strip. Adjustable voltage d-c generators co-ordinated by modern control provide smooth, fast, precise operation.

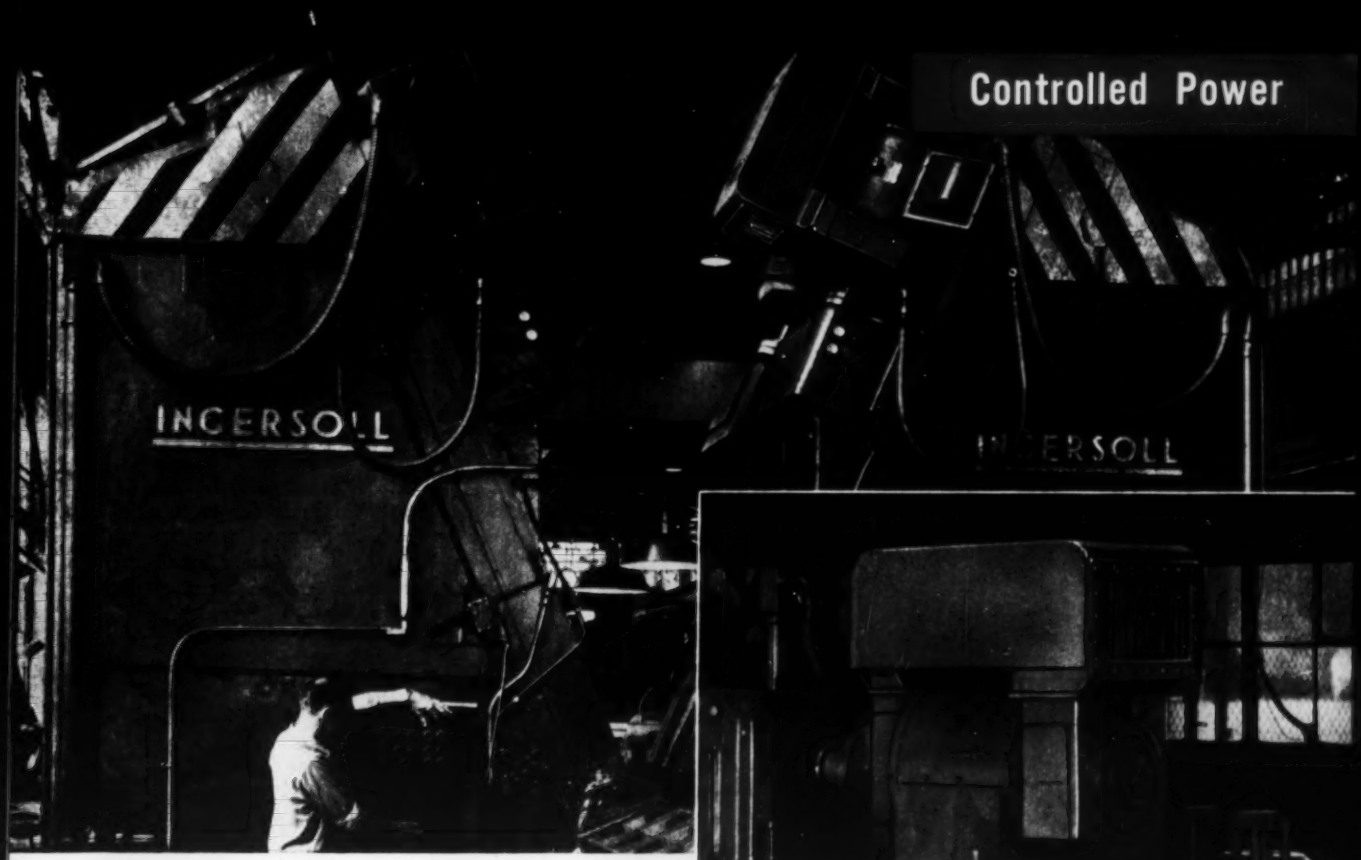
How General Electric d-c drives

Accurate speed from d-c drive co-ordinates sections of paper machine into fast flow of production—up to 300 tons/day. Mechanical design of machine is simplified, output increased.





Accurate Speeds



Controlled cutting power is provided by unit-cooled d-c motors. Torque and speed of this boring mill for diesel engine blocks is maintained at optimum point for long tool life and top production.

help make production automatic

DC MOTORS STEP UP PRODUCTION THROUGHOUT INDUSTRY

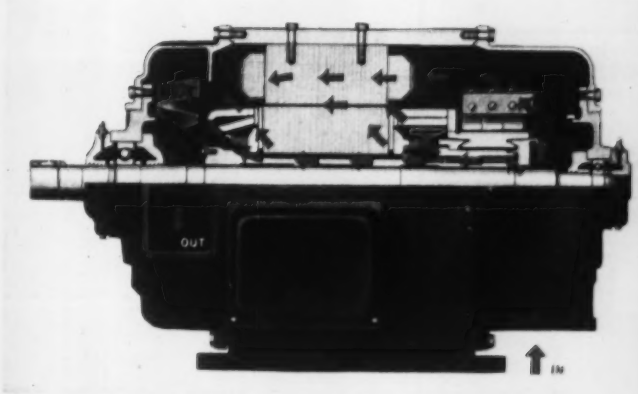
DC drives give you precise control of torque, speed, and power—essential in automatic production. The degree of precision depends on the steady performance and continuity of service of d-c motors and generators. In applications requiring close speed regulation, quick reversing, severe peak loads, G.E.'s complete line of Type CD-1000 motors is:

ECONOMICAL—the right speed at all times means less waste, fast production and low manufacturing costs per unit.

EASY TO MAINTAIN—built for long life with occasional inspection only—easily removable inspection covers. All connections are enclosed, yet easily accessible.

VERSATILE—Today's industry is more automatic than ever before. Regardless of application—in steel, paper, machine tool, and many other industries—G-E direct-current motors have gained the reputation of delivering continuous output at lower costs and accurate speeds for peak production.

FOR MORE INFORMATION, contact your nearest Apparatus Sales representative, or write for bulletin GEA-5497, general-purpose d-c motors, or GEA-6091A, totally-enclosed unit-cooled d-c motors. Section 810-4, General Electric Co., Schenectady, N. Y.



Excellent ventilating system gives positive ventilation to entire motor. Shaft fan on armature helps dissipate heat and keeps motor within rated temperature rise.

GENERAL ELECTRIC

Cycle Cut Boosts Output

BY USING two automatic indexing air-hydraulic drill units, they've picked up 100 per cent in production on a job at Rollway Bearing Co., Syracuse, N. Y.

The operation is drilling and reaming both radial and thrust retainers (metal is bronze) of precision roller bearings. Designed by Rollway's engineers, the machines have an index cycle of 2 seconds.

Contrast—The job was done on two converted gear chamfering machines. Machining took two complete operations. Each required a complete revolution of the mechanically-actuated index plate, as well as replacement of drills between the two operations.

On the new setup, each drill consists of an air-hydraulic drill unit, a head that swivels the retainers into drilling position and an index plate that's operated by a separate pneumatic cylinder.

The Switch—To change from radial to thrust drilling, the operator pulls a taper pin and swivels the work head 90 degrees to the desired position.

An interlocked electric control circuit co-ordinates operation of the drill heads and indexing fixtures. Failure of any part of the control circuit sends the machine back to the start position.

The index plate cycle is actuated by an air piston. A dog rides the plate and trips a switch to indicate full rotation and cycle stop.

MACHINE TOPICS

By R. F. HUBER, *Machine Tool Editor*

AUTOMATION already has had a great effect on some industries, on many plants and on a wide variety of jobs. It's interesting to note that the experts who know automation best think we're just getting a start in the field.

Sample of what lies not far ahead is being installed in a high - production machining line. All machines are hopper fed. The hoppers are filled from a conveyor which operates only when the level of parts in the hopper drops to a specified level. Workpieces going into a secondary operation are checked—bad parts are sorted out and don't go into the machine.

In some cases, in-process checks will be made and the results will be relayed as corrective factors back to the responsible machine. In effect, it's a system of continuous compensation and correcting.

This whole system, gaging, parts supply and all, will be fully automatic.

Labor—In automation setups such as this, the machine operator becomes a highly trained maintenance man. Milton O. Cross, Jr., president, Cross Co., Detroit, says automation will result in a broad upgrading of labor. He adds that labor will be considered a capital investment of business, rather than a current cost.

Speaking before a joint session of the Machine and Production Engineering Divisions of the American Society of Mechanical Engineers in New York, Mr. Cross also predicted that dulled tools will soon be replaced automatically, without shutting down production at all.

Despite the spectacular advances in big-scale automation, perhaps the most important single factor is that the concepts and ideas apply also to relatively small-scale operations on standard or semistandard machine tools. Trend comments from more than 20 machine builders show that the application of automatic devices to standard equipment is one to watch.

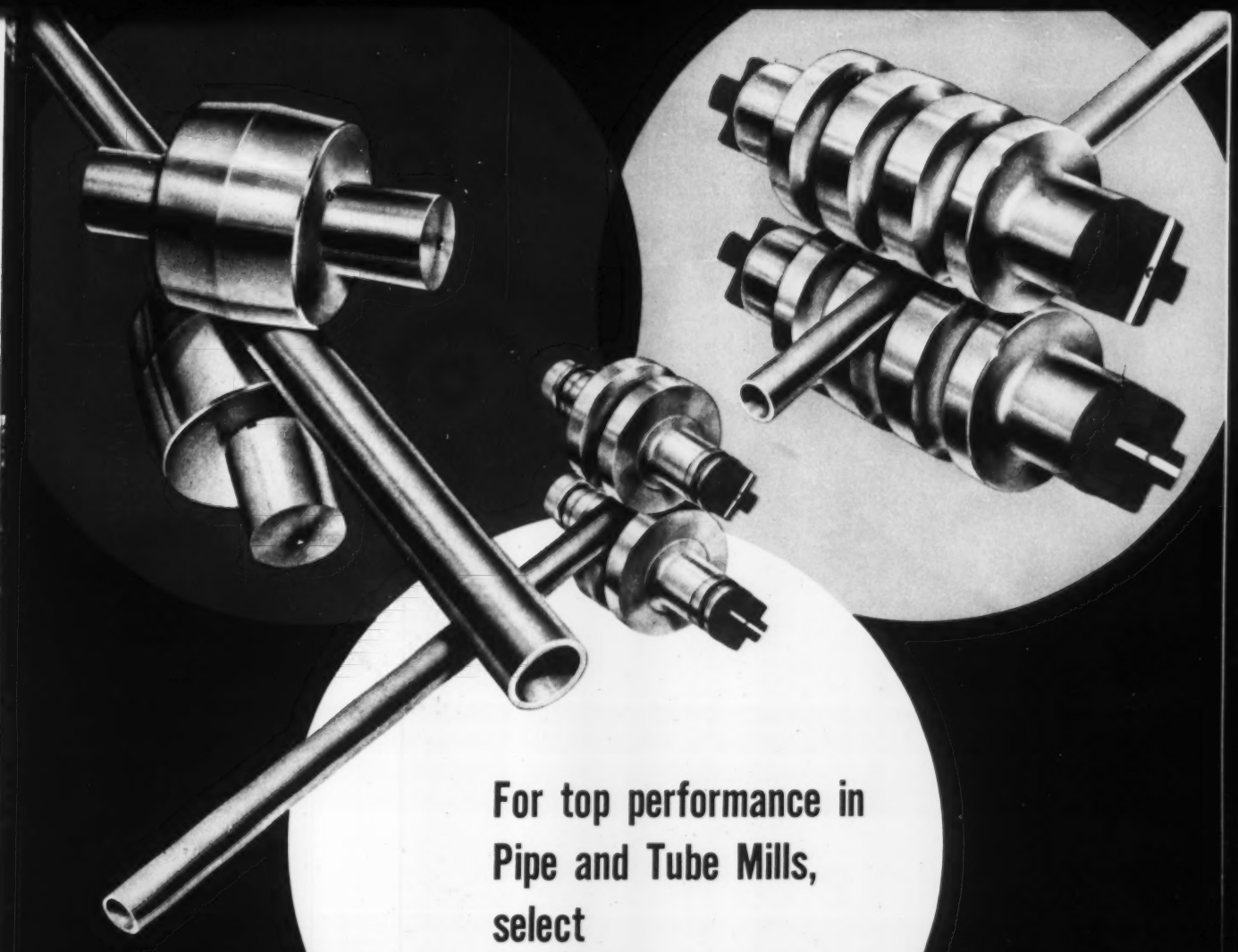
Recognition

Clarkson College of Technology, Potsdam, N. Y., has awarded an honorary Doctor of Science degree to F. S. Blackall Jr., president and general manager of Taft-Peirce Mfg. Co., Woonsocket, R. I., for his active part in the development of the engineering profession.

Mr. Blackall, past president of both the American Society of Mechanical Engineers and the National Machine Tool Builders' Association, has been active in engineering education at his alma mater, MIT, for a number of years.

Replacement

On equipment replacement, W. F. McCormick, of the Cresap, McCormick and Paget management engineering firm, says the biggest problem in equipment analysis lies in the organization to get the job done. "Few in top management," he says, "realize that engineering analysis is but one phase of their over-all production, engineering, financial and sales planning, and must be made a functioning part of these activities."



For top performance in Pipe and Tube Mills, select MACK-HEMP STRIPED RED WABBLER ROLLS!

You'll find Mack-Hemp Rolls producing maximum output at low cost, on every specific forming and rolling job in modern high speed types of welded and seamless pipe and tube mills.

These famous Mack-Hemp Rolls with the Striped Red Wabblers are made with correct metallurgical characteristics for their particular pipe mill purposes . . . such as the well-known, tough, durable Machempite rolls for piercing; resistant, high tensile strength Technichrome (Adamite) rolls with exceptionally good bite for the high mills; and the strong deep chill type, hard surface Nironite rolls for sizing.

To meet the special rolling requirements and exacting demands in all phases of modern metal forming, mill operators today are realizing more than ever that it pays to keep an eye on what's new and different at Mack-Hemp.

MACKINTOSH-HEMPHILL COMPANY

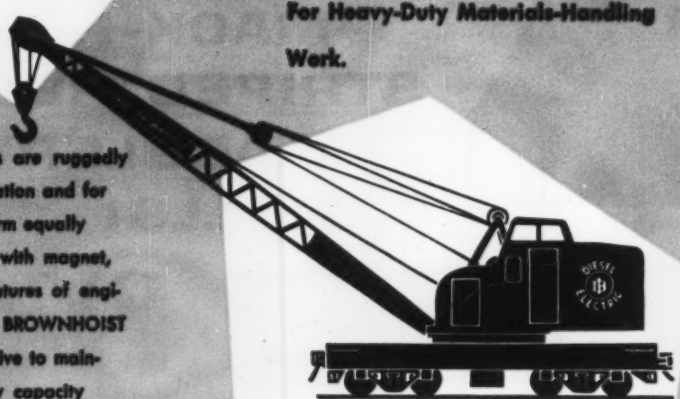
Makers of the Rolls with the Striped Red Wabblers PITTSBURGH AND MIDLAND, PA.

MACKINTOSH-HEMPHILL PRODUCTS INCLUDE: all types of cast mill rolls . . . improved Johnston patented corrugated cinder pots and slag handling equipment . . . Mackintosh-Hemphill rotary straighteners—electronically controlled contouring lathes—screw feed roll turning lathes—heavy duty engine lathes . . . shears . . . end-thrust bearings . . . steel and special alloy castings . . . reversing hot strip mills . . . Y-type cold strip mills

INDUSTRIAL BROWNHOIST 250 TON

THE WORLD'S LARGEST DIESEL POWERED RAILROAD CRANE

Designed primarily for Railroad Emergency Service, this 250-Ton Crane is the biggest member of the BROWNHOIST Family of Powerful Locomotive Cranes For Heavy-Duty Materials-Handling Work.



Brownhoist Diesel Locomotive Cranes are ruggedly built for continuous, heavy-duty operation and for long, dependable service. They perform equally well as switch engine or crane and with magnet, hook or bucket. Many advanced features of engineering design and construction make BROWNHOIST Cranes easy to operate and inexpensive to maintain. Standard models to meet every capacity requirement. Write for complete information.

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INDUSTRIAL BROWNHOIST CORPORATION, BAY CITY, MICHIGAN • DISTRICT OFFICES: New York City, Philadelphia, Cleveland, San Francisco, Chicago; Canadian Brownhoist Ltd., Montreal, Quebec • AGENCIES: Detroit, Birmingham, Houston, Los Angeles.

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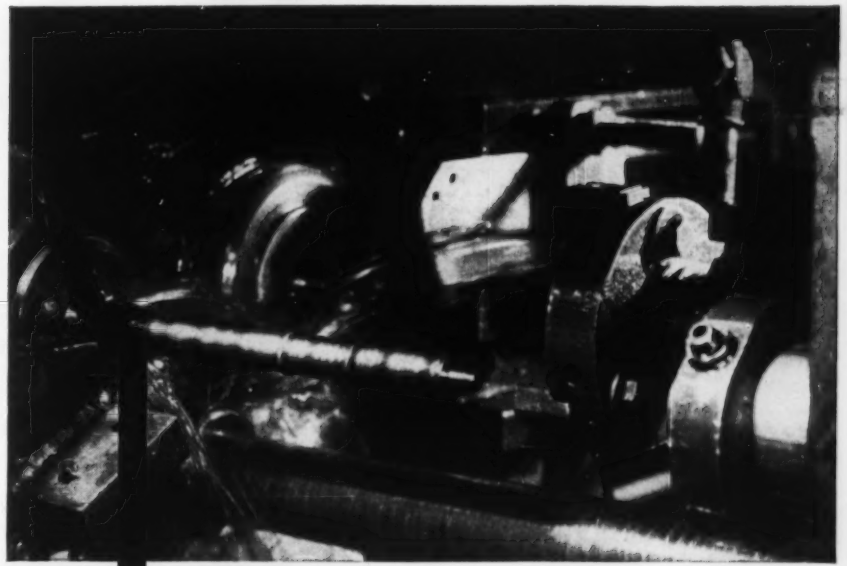

How to make duplicate stainless steel parts economically

Make them out of ENDURO Stainless Steel Cold Drawn Bars. Then you get high production rates from your automatics, plus all the high physical and chemical properties you want from stainless steel.

Here's how one manufacturer does it: Edward Valves, Inc., East Chicago, Ind., makes a new MUDWONDER Valve used in the oil fields. It must have high resistance to corrosion and long life.

Valve stems are made of ENDURO Cold Drawn Types 410 and 416. And Edward methods engineers say they get good production for these reasons:

1. **High speeds and feeds can be used**
2. **Surface finish is excellent**
3. **Tool life is longer, down-time for re-grinding is less**

You can have these same advantages in your stainless steel parts, by specifying ENDURO Cold Drawn Bars. And Republic metallurgists will be glad to help you choose the right grades for best production on your present machines. Write to:

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Alloy Steel Division • Massillon, Ohio
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Export Department: Chrysler Building, New York 17, N. Y.

REPUBLIC ENDURO FREE-MACHINING STAINLESS STEEL

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Other Republic Products include Carbon and Alloy Steels — Titanium — Pipe, Sheets, Strip, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

You Can Use Linear Programming To Advantage If—

1. There are a number of different ways of doing the job or a variety of jobs to be done.
2. There is a difference of efficiency between choices, i.e., one machine takes longer or costs more to operate.
3. There is a set of restrictions or upper limits, i.e. each machine has only so many hours each week for scheduling.
4. There are lower limit requirements, i.e. so many pieces of a certain product must be made.
5. There is a management-level goal established, i.e. maximum profit, lease cost, shortest production time, etc.
6. There is a common unit of measure for these conditions that can be brought into a mathematical formula.

By NYLES V. REINFELD
Executive Services
Cleveland

Mathematics Spots Hidden Profits

Tube mill gets 15 per cent more out of its machines with more accurate scheduling. Applied to other phases of the operation, programming saved another $350,000 a year

LINEAR PROGRAMMING, a high-sounding title for a practical method of production planning, is gaining a growing list of disciples in metalworking plants. Orders are getting smaller, more numerous. Selecting the best of a large number of courses of action is more complicated, more important.

But the average production planner sees linear programming as a tedious and time consuming chore, often requiring large-scale computers and highly trained operators.

Basic Error—It is natural to think that maximum production and maximum utilization of productive machinery are synonymous. In most cases, however, they are not when one spells out the objective mathematically. Here is where linear programming is most valuable to industry.

Setting up such precise definitions frequently reveals that company policies are composed of two or more objectives, all of which are in conflict. The production superintendent who seeks maximum production and insists on keeping all machines busy is generally defeating his purpose. It's seldom possible to do both.

Case in Point—There are over 262,000 ways to schedule a single size of tubing through the plant of a large midwest manufacturer. When you consider that the company makes several thousand sizes of tubing, the combinations are too great for solution by trial and error. In this case, the objective was maximum utilization of the equipment.

Two systems of measuring the work load had been used. The first was to build a weekly schedule on the basis of pounds per week; the second, on the basis of feet per week. The word "schedule" is used loosely. The procedure is to allocate a certain number of pounds or feet to different categories, which are set up on the basis of size ranges. For example, history may show that between the sizes of 1½ and 3 in. the plant has completed an average of 150,000 ft each week. This measure then becomes a scale for future scheduling.

Gathering Data—The only equipment considered in the Linear Programming schedule are the plant's eight drawbenches. They were the bottleneck.

Standard draws for each size of tubing are in layout books. They show the breakdown of the tubing through each draw to the finished size. Layouts also show only the ideal or best bench for drawing a particular breakdown.

Before such data can be used with Linear Programming, it is necessary to make some conversions and additions. A special card was made up for every size tubing, showing every bench for a certain draw and the time it takes.

Programming the Schedule—At this point, all times are converted to time-per-piece and all combinations and possibilities for scheduling a piece are opened up. Time-per-piece is important here. All orders are scheduled by pieces, and the large number of combinations is a fundamental requirement of the programming.

If formal procedure were being followed, next step would be to set up a matrix for solution mathematically. But because of the type of data involved, a fast method could be devised that would give answers within 3 per cent of the best answer. This solution is presently being used to schedule the mill. It takes one clerk using an office calculator about 1½ hours per week to solve the schedule.

Building the Schedule—The schedule card (see enclosed sam-

SCHEDULE CARD

Mix Std.
Size: 500 x .025 Weight: 2.9# Part No.: 3/8 C
Length: 20′ End: 30#

Draw	Pcs. Good	Total Pcs.	Length	General Time/Draw	General Time/Pc.	Group/Pc.	Group	Layout Bench
1		24	31	.912	.038	.038	1	1,2
2		24	31	.980	.041			3
3	3	24	50	1.545	.064	.105	2	3
4		8	19	.672	.084			5,6
5		8	33	1.033	.129	.213	3	5,6
6	4	8	99	1.503	.188			7,8
7		2	22	.745	.372			7,8
8		2	32	1.006	.503			7,8
9(A)	2	2	42	1.500	.750	1.740	4	7,8

Schedule cards are made up for every order and kept on file. Figures in "general time/draw" column are times it would take to make those draws on benches 1 and 2. "General time/pc." is unit time per piece conversion

ple) is the key factor behind speed of solution. One card is made up for each order as it comes in. When the schedule is to be built, the appropriate card is pulled from the file, and the data is taken from it.

Suppose an order for 100 pieces of ⅜ C were ordered. That schedule card would be pulled and the order entered on the schedule sheet by multiplying the "group/piece" figures by 100 and listing the product according to the layout benches as shown on the example sheet. This same procedure is followed for every order to be scheduled at one time.

With the simplified solution at most only five multiplications are required for each order because of the "group/piece" modification introduced. When the whole schedule is built this way, there will be benches that are overloaded or underloaded. Loads can be adjusted by transferring work to alternate benches without having to refer back to the schedule cards.

Adjusted Schedules—Bench 9 is normally reserved for long lengths. Because it was underloaded on the enclosed sample schedule, it is possible to schedule part ½B as a long length, which is a multiple of the original length scheduled. In this way, bench 9 is properly utilized; endage and points are reduced and some handling and machine time is saved.

As you will notice, there is still available capacity on some benches. Present practice is to give the scheduler a list of optional orders to be produced in addition to his regular orders. He selects optional orders to balance out the schedule. Through more precise scheduling of its equipment, the company has been able to increase production 15 per cent.

Other Areas—In a continuation of the above study, evaluation was made of the tube mill products to determine which should be produced, which should be purchased. Study included machine analysis, sales forecasts, shipping costs to all warehouses and profit per piece.

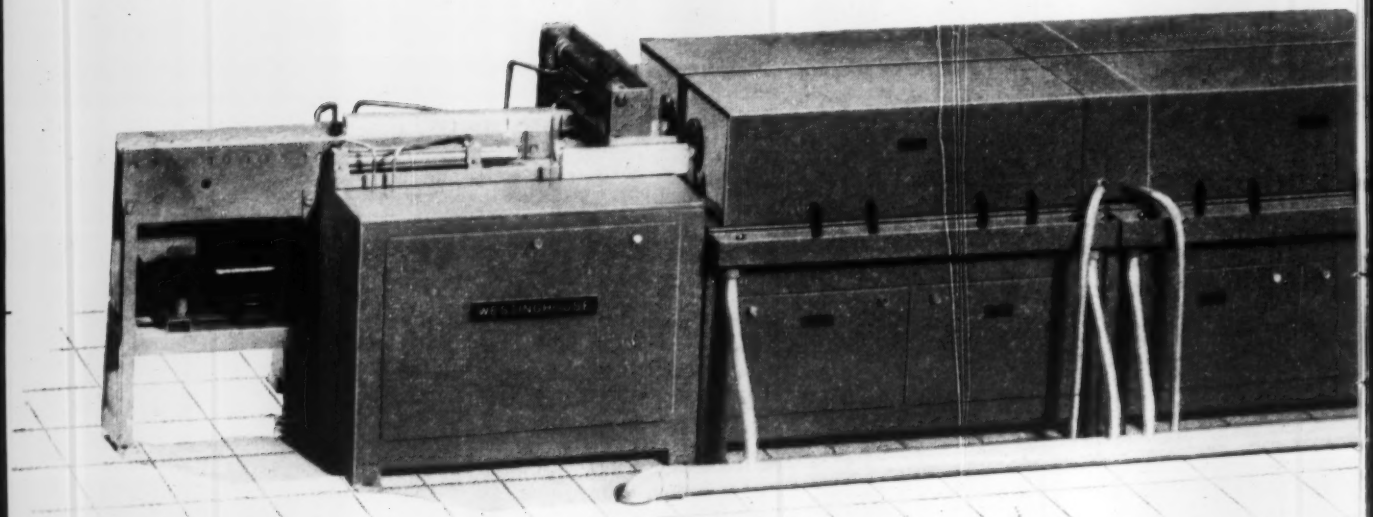
Study showed that profit could be increased by $350,000 over last year by selective purchasing and production with Linear Programming. In another plant, programming was teamed up with operations research to schedule large groups of machines for both running and setup times. Savings were $100,000 a year.

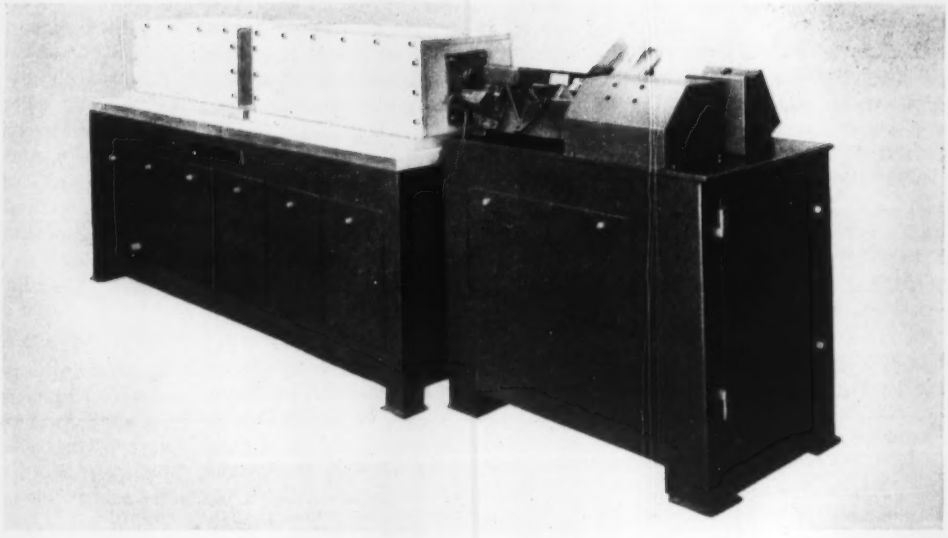
Sample tube mill schedule after overloads and underloads have been adjusted. On the first try, benches 5, 6 and 7, 8 were overloaded so work was shifted

SAMPLE TUBE MILL SCHEDULE

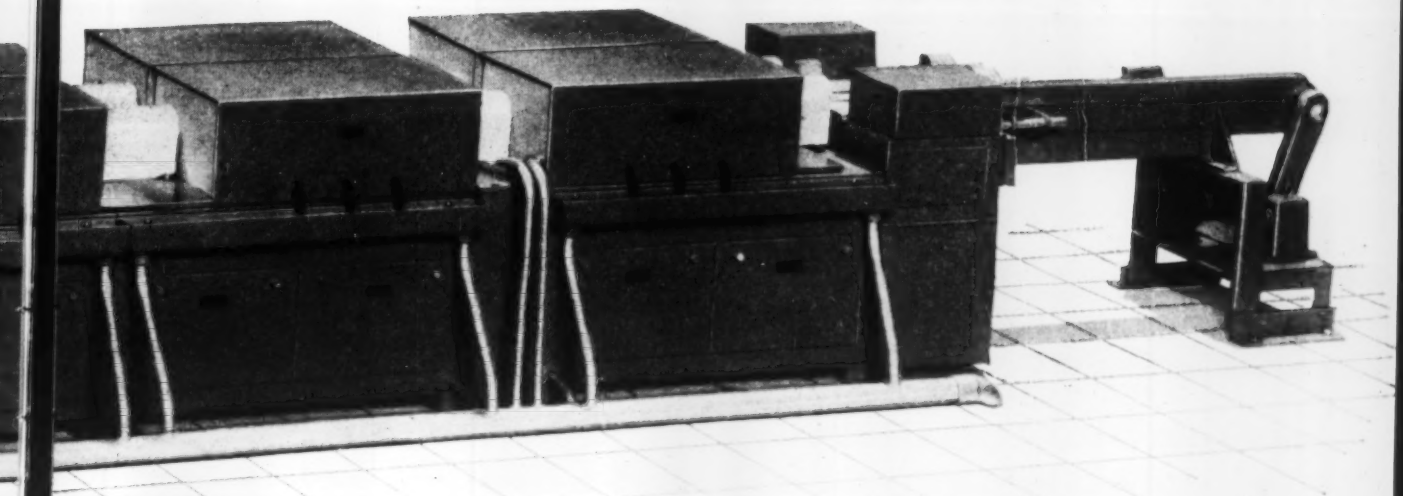
PART	QUANTITY	BENCH #1, 2 TIME	DRAWS	BENCH #3 TIME	DRAWS	BENCH #5, 6 TIME	DRAWS	BENCH #7, 8 TIME	DRAWS	BENCH #9 TIME	DRAWS	
1.050 x .080	1,025	195	1	538	2,3	1,320	4,5					
.625 x .038	500	29	1	81	2,3	934	4-9	742	6-9			
.375 x .034	525	16	1	44	2,3	1,200	4-10	1,090	6-10			
.375 x .030	3,200	80	1	815	2-5	592	4,5	6,650	6-10			
½ A	500	38	1	105	2,3	244	4,5	582	6,7			
⅜ A 3	600	30	1	84	2,3	444	4-6	224	6	366	7	
¾ A 3	1,500	228	1	633	2,3	1,170	4,5			948	6	
½ B	1,150	16	1	174	2-5	128	4,5	2,450	6-11	2,450	6-11	
¾ B	500	57	1	158	2,3	306	4,5	339	6,7			
1 B	500	76	1	210	2,3	730	4-6	331	6			
												Total
LOAD		765		2,842		6,348		7,571		3,764		21,290
AVAILABLE		3,600		2,900		6,400		7,600		3,800		24,300

Dual-frequency heating at its best . . . the equipment shown here (using 60 and 960-cycle power) heats 3½″ R.C.S. steel billets, 8″ long, to 2150° forging temperature at a rate of 480 an hour. An actual installation, using six of these machines, heats 40 tons an hour!





Another outstanding example of Westinghouse dual-frequency induction heating for forging. Clean, cool, and safe, this billet heater takes only 4′ x 8′ of production floor area. Using dual-frequency power (60 and 960 cycles) it heats 2½″ diameter, 3¾″ steel billets to 2250° forging temperature at a rate of 360 per hour.



Boost forging rate 300%, cut costs 60%...

with Westinghouse induction heating

Based on a recent forging analysis, these figures tell dramatically what savings are being accomplished by Westinghouse induction heating compared to today's "old-fashioned" methods.

How? Here are seven big savings:

- Scale loss reduced to 6/10 of a percent—60 to 80% savings.
- Longer die-life because of low scale.
- Maintenance costs cut 80%.
- Scrap loss practically eliminated.
- Flexible to all production needs—short start-up time; stand-by losses are low or nonexistent. Accurate repetitive control of temperature.
- Shearing costs eliminated.
- Pushbutton operation—completely automatic—makes it practical to put forging right in the production line.

Westinghouse ingenuity is the key. Successful installations—some with even better savings—prove that two factors are vital to full benefit of induction heating . . . good equipment and expert application.

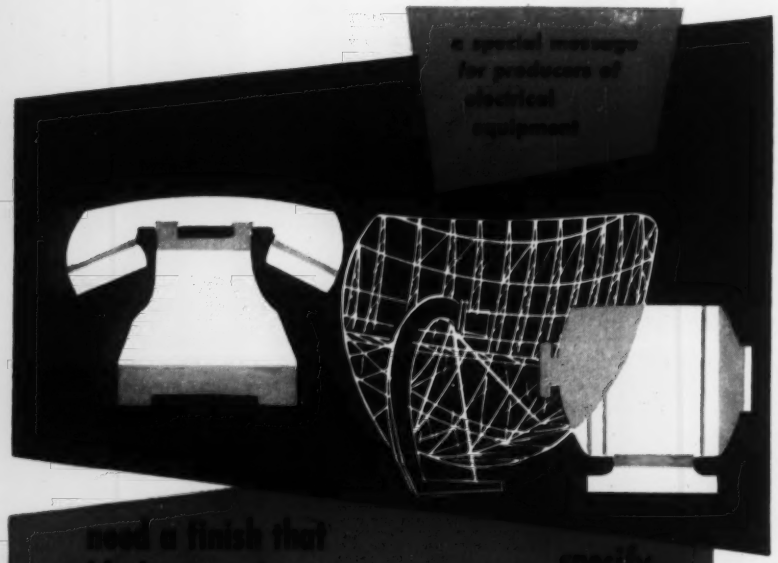
Westinghouse offers you a complete, one source service to analyze induction heating for *your* plant. Survey, recommendation, engineering and manufacturing—all by experienced Westinghouse personnel—assure you the proper frequency, power and method of handling to most effectively reduce costs in your plant.

Right now is the time to investigate. You can lead the way to lower break-even points, decreased unit costs—point to extra profit possibilities—by bringing Westinghouse into your forging picture. Call your representative or write: Westinghouse Electric Corporation, H. F. Heating Section, 2519 Wilkens Ave., Baltimore 3, Maryland.

J-02292-B

INDUCTION HEATING FOR
HARDENING • JOINING • ANNEALING
FORGING • HEAT-TREATING

YOU CAN BE SURE...IF IT'S Westinghouse



need a finish that blocks corrosion, maintains conductivity?

specify IRIDITE®

Here's peak corrosion protection combined with conductivity, weldability and solderability. Here's a finish that holds paint firmly, prevents underfilm corrosion. Here's a line of attractive final finishes to add quality and sales-appeal. Here's Iridite . . . and here's how you can use it:

ON ZINC AND CADMIUM you can get highly corrosion resistant finishes to meet any military or civilian specifications and ranging in appearance from olive drab through sparkling bright and dyed colors.

ON COPPER . . . Iridite brightens copper, keeps it tarnish-free; also lets you drastically cut the cost of copper-chrome plating by reducing the need for buffing.

ON ALUMINUM Iridite gives you a choice of natural aluminum, a golden yellow or dye colored finishes. No special racks. No high temperatures. No long immersion. Process in bulk.

ON MAGNESIUM Iridite provides a highly protective film in deepening shades of brown. No boiling, elaborate cleaning or long immersions.

AND IRIDITE IS EASY TO APPLY. Goes on at room temperature by dip, brush or spray. No electrolysis. No special equipment. No exhausts. No specially trained operators. Single dip for basic coatings. Double dip for dye colors. The protective Iridite coating is not a superimposed film, cannot flake, chip or peel.

WANT TO KNOW MORE? We'll gladly treat samples or send you complete data. Write direct or call in your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified telephone book.

Iridite is approved under government specifications

ALLIED RESEARCH PRODUCTS
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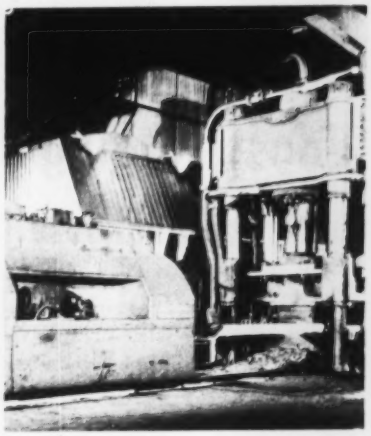
Blooming Manipulator

PRECISE, remote control of a 5-ton forging manipulator at Cameron Iron Works Inc., Houston, establishes a first for this type of equipment. The manipulator operator is positioned next to the press operator in an enclosure located next to the press. This provides excellent visibility and prevents the physical abuse that the operator would encounter if he rode the equipment for the conventional 8-hour shift.

The remote-controlled manipulator, designed by Kendall Engineering Co., Alliance, O., uses a standard Cone-Drive vertical speed reducer to operate the peel rotation of the manipulator.



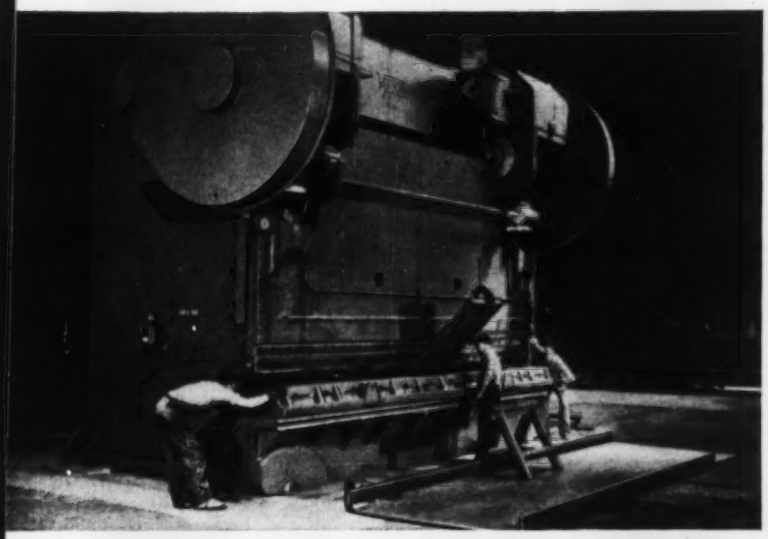
INGOT HANDLING
. . . operates by remote control

Service Conditions—Since the service conditions are unavoidable in the Cameron installation, Kendall engineers selected the 8-in. center distance speed reducer with a 20:1 reduction ratio. The reducer is driven by an 1800 rpm, 20 hp motor and has a more than adequate safety factor.

In service, the Kendall manipulator is used in the process of blooming down a 5-ton ingot under a 1500-ton steam, hydraulic high speed press. An overhead crane sets the ingot in the cradle adjacent to the press. The manipulator lifts the ingot from this cradle and handles it through the press during the entire blooming operation. When the blooming operation is completed, the crop end is cut off and the formed billet is taken away from the press by an overhead crane.

CONTINENTAL

WELDMENTS, FABRICATION, HARD FACING



EQUIPPED TO SERVE
EXPERIENCED TO SAVE

Whether you need complete fabrications or sub-assemblies—one at a time or on production basis—Continental weldments can save you time and money.

Modern weld shop equipment can handle all types and sizes of weldment components. Typical, at the left, are the 1000-ton press brake, the heavy-duty pyramid roll and the automatic submerged-arc welding equipment being used to deposit hard-facing material.

Continental has gained unusual experience in welding varied structures for customers in many industries. In fabricating components for Continental rolling mills and special machinery. In producing welded armor and tank hulls for our armed forces.

Continental can help with your design—produce the needed castings—and cut, shape, weld, heat-treat and machine exactly to your specifications.

For the complete story on facilities and experience at your service, write for new Brochure S on Continental Weldments.

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- **WELDMENTS**
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Foundry & Machine
Company

Harden Piston Rings with HEVI DUTY BOX FURNACES

U.S. Hammered Piston Ring Company of Stirling, New Jersey, manufacturers of aviation piston rings, found that very close tolerances could be met when hardening their rings in Hevi Duty Furnaces.

These furnaces operating 24 hours a day treat thousands of rings in size from 1 to 33 inches in diameter. Leo Maren, Plant Superintendent, says, "I have used Hevi Duty Furnaces for over 20 years. I like the even heat and uniform temperatures afforded by the heating elements located on the six sides of the work chamber."

Learn more about the many features that are designed into Hevi Duty Box Furnaces.

Write for Bulletin 441.

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HEVI DUTY ELECTRIC COMPANY

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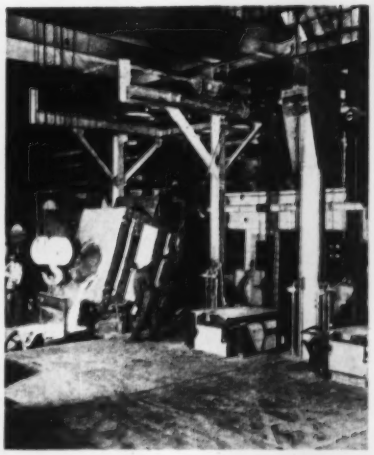
Dry Type Transformers *Constant Current Regulators*



High-Frequency Melting

New high-frequency melting furnaces make possible production of centrifugal castings in a wide range of ferrous and nonferrous alloys at Sandusky Foundry & Machine Co., Sandusky, O. The company also has completely modernized and enlarged its metallurgical laboratories and facilities

ASTM Corrosion Study

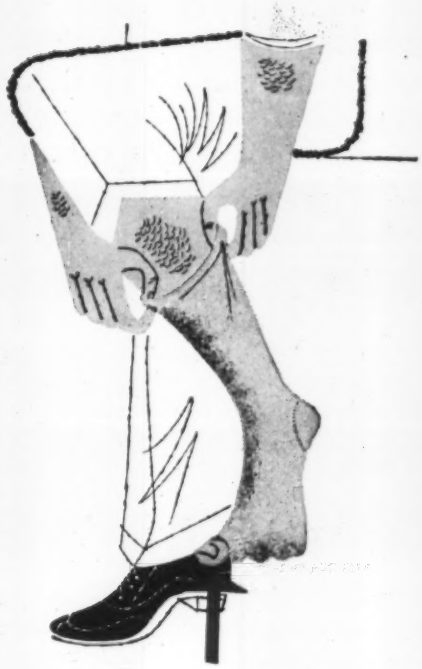
EFFECTS OF atmosphere on copper-nickel-chromium-plated steel panels and lead-plated steel panels have been reported by ASTM. Results will be published as a part of the 1955 report of Committee B-8 (Electrodeposited Metallic Coatings).

Six types of chromate coatings are being studied in four environments, two indoor and two outdoor. Indoor exposures are of two types, one in a typical shipping box and the other with specimens mounted on a rack. Outdoor exposures are at New York City and Kure Beach, N. C.

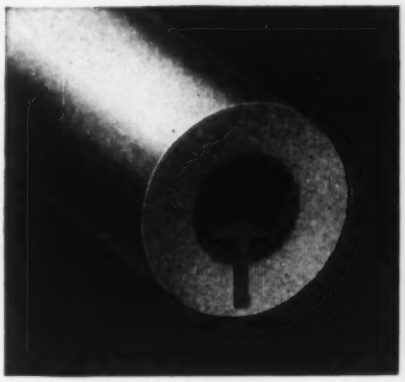
The committee has changed its method of determining weight loss of lead on lead-plated panels from total weight loss to weight loss on separate surfaces.

Solderability — A committee section on tin and tin alloys will consider the effect of aging on solderability and later a method of testing solderability. Early investigations will concern only essentially pure tin coatings. Later, they may include the tin-lead and tin-zinc coatings.

A new section will study stress in electrodeposited coatings. Other groups are investigating effects of temperature on coatings.



a hole here is a nuisance...



a hole here is an advantage

Crucible Hollow Tool Steel Bars are saving time and money for more and more members of the metalworking industry. By using these hollow bars you eliminate drilling and boring operations, increase machine capacity and cut scrap losses.

Now, you can get hollow bars of any of Crucible's famous tool steel grades, in almost any combination of O.D. and I.D. sizes. And you can get *immediate* delivery of five popular grades from your local Crucible warehouse—KETOS® oil-hardening, SANDERSON® water-hardening, AIRDI 150® high carbon—high chromium, AIRKOOL® air-hardening, and NU DIE V® hot-work tool steels.

Your Crucible representative can point out ways to save time and money by using Crucible Hollow Tool Steel Bars.

CRUCIBLE first name in special purpose steels

54 years of Fine steelmaking **HOLLOW TOOL STEEL**

CRUCIBLE STEEL COMPANY OF AMERICA • TOOL STEEL SALES • SYRACUSE, N. Y.

Machining costs are 25% lower

This valve is used for a fuel return regulator check. Although the manufacturer was one of the first to use Carpenter Stainless No. 8 (Type 303) when it was first introduced, there have been occasions and conditions which required the use of ordinary makes of Type 303 Stainless Steels. The customer reports: Carpenter No. 8 *consistently* enables them to show a 25% saving in machining costs because of its constant uniformity and easier machinability.

Reject rate is reduced

An important requirement of this valve is that it be "leak-proof" in operation under pressure. To assure a tight seal, some surfaces are machined to a 5 or 10 micro-inch finish with tolerances as close as .0005". Because of the machinability and finishes obtained with Carpenter No. 8, rejects always take a sharp drop when compared with competitive Type 303 Stainless Steels.

Machine operators are happier

Here's an interesting sidelight: Machine operators can always spot an ordinary Type 303 without being told, because of the way it cuts in the machines. With Carpenter No. 8 they tell us they *know* the job will run smoother and faster with improved results. The same thing can apply in your *own* plant. So if you're looking for a way to improve performance and reduce costs on your stainless parts, CHANGE to Carpenter No. 8. See what the difference can mean to you. THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

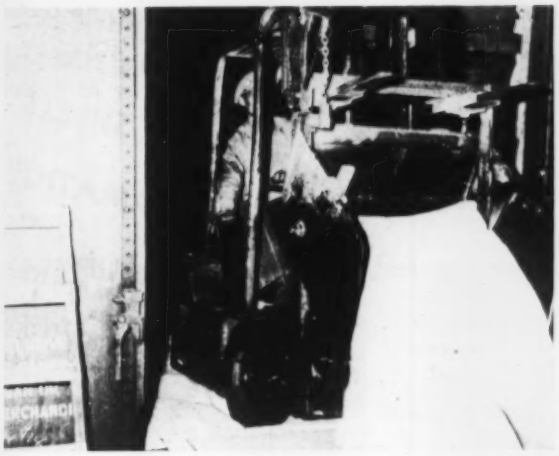
take the problems out of production

...change to Carpenter STEEL

Free-Machining Stainless

IMMEDIATE DELIVERY from local warehouse stocks!
Export Department: The Carpenter Steel Co., Port Washington, N.Y.— "CARSTEELCO"

. . . from rail car to storage



UNLOADING white sand from rail cars is a time-consumer in foundries. For example, until recently Electric Steel Foundry Co. used hand dumping 1-ton buckets and tied up a crane while it made 48 trips to the storage bin. The job kept four men busy for 3 hours.

Recognizing the problem, the Portland, Oreg., firm fabricated two 4-ton hoppers that are self dumping. They use four men for 30 minutes to clear the car doorway. Two men take another hour to finish the car.

Fewer Trips Necessary—The crane operator drops a hopper on either side of the car. While one is dumped, a Hyster lift truck loads the other with a special scoop lift attachment. The system cuts crane trips down to 12 and releases the equipment for work in the scrap yard.

Construction of the boxes makes it unnecessary for a man to remain on top of the sand bins to hand dump the hoppers. They're tripped by a lever mechanism that opens a door at the bottom.

. . . through tunnel-type annealing

TUNNEL-TYPE furnaces, used almost exclusively by the ceramic industry, are moving into steel processing. One of the first installations was made a year ago by Timken Roller Bearing Co. Now they've completed a second furnace—total cost, about $1 million—at their Gambrinus, O. plant.

Fork Lift Keeps Up—To charge and discharge work, Timken uses a fork lift that works through special brackets welded to the bottoms of the hearth car frames. Cars move 8 ft per hour. The truck keeps up with the annealing work by handling two hearth carloads of tube and bars an hour.

The furnace is housed in a sheet steel building 320 ft long. Charge and discharge ends are covered by sheds which are 40 x 60 and 60 x 60 ft. The truck operates in these sheds, shuttling from one to the other on a connecting concrete runway.

A Clear Track—Radiant heating takes care of snow and ice that might interrupt the truck's rounds in the winter. About 8000 ft of pipe installed as heating coils in paved areas and the runway does the job. Waste heat from the furnace heats the water and antifreeze mixture used as the circulating medium.

The new furnace is fired by natural gas and uses propane as a standby.

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#29—METEX PAINT STRIPPER T-19
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Casting Straightener

In a Canadian foundry a Cecostamp drop hammer straightens malleable iron castings. The hammer combines air piston lift and gravity drop for speedy variable stroke. It is being much used for coining as well as straightening. Maker is Chambersburg Engineering Co., Chambersburg, Pa.

Air-Operated Fixture

THREE CLAMPS, air operated move an aluminum casting, called a vertical frame bar, at International Business Machines Corp. One clamp moves longitudinally and two transversely to hold the workpiece against locating stops.

Clamped Style—All three clamps are connected to a common air supply line and operate simultaneously when valves connected to the line are opened. As a safety feature, two button-operated air valves are placed in series in the line so the operator must place one hand on each button to close the clamps.

Both hands then are in a safe position before clamps move inward. Unclamping is done with a single valve lever since there is no place where fingers can be caught in unclamping.

Saving in Loading — As all clamps close instantly when supply valves are opened, there is a considerable saving in loading and unloading time over that required for operating hand clamps. This saving justifies application of the air-operating equipment, according to IBM.

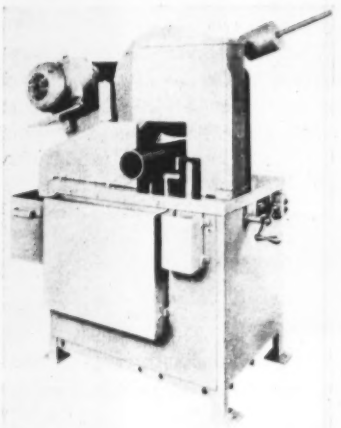
NEW PRODUCTS and equipment

Reply card on page 141 will bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue.

Cutting Machine

. . . dry abrasive

This machine is capable of speeds up to about 3 seconds per sq in. Campbell model No. 28 is available in stationary and portable types. It is designed to handle material up to 4 in. square at 90 degrees to axis for solid steel, 8 x 90 degrees to axis for channels. (These specifications are based on using an 18-in. diameter cutting wheel, with a 10-hp



motor. Work size cutting capacity is reduced when a smaller diameter cutting wheel and less horsepower are used.) The wheel is lowered into the work by a hand lever. The 1 in. diameter wheel spindle is driven by V-type belts.

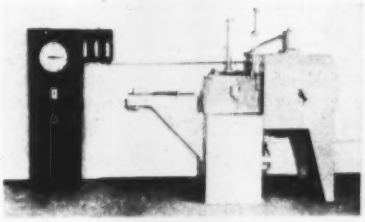
Since the Sever-All is an oscillating type machine, the amount of abrasive wheel contact is reduced and cutting is done with a minimum of pressure on the abrasive wheel. A double-acting work holder automatically positions the material. American Chain & Cable Co. Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 1

Metal Treating Unit

. . . for lab, research

Model RT-25-E, built for temperatures up to 2000°F, is equipped with an 8 x 14 x 8 in. hearth, electric radiant-type heating tubes and a sealed quench or cooling chamber. It's capable of hardening, carburizing, carbonitriding and brazing.



The quench tank and cooling chamber are directly connected to the forward or loading end of the hearth. An airdraulic-operated door separates the chambers. Electric heating elements are mounted horizontally between brick insulation and an interior baffle. The circulating fan is made of high heat-resistant alloy metal and is short coupled to a slow starting motor equipped with water-jacketed bearings and a built-in safety switch. Ipsen Industries Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 2

Plastic Material

. . . for floor repair

Formulated to repair floor cracks and prevent further surface deterioration, Jiffy Floor can be applied without interfering with production or traffic. It withstands heavy loads immediately. A fine granular, ready-to-use product, it fills hairline cracks, shallow holes, spalled floors or expansion joints.

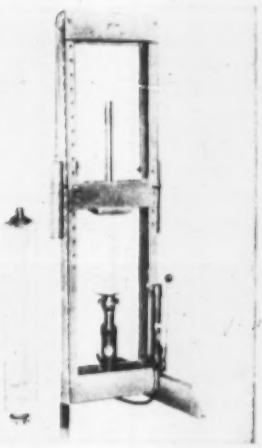
It is said to be waterproof, dustless, skid-proof and noiseproof. Ready for use, it comes in 5, 10, 30 and 55 gallon drums. Monroe Co. Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 3

Hydraulic Jack

. . . for surface finishing

The arbor press was designed to mount wide-faced buffs on long spindles. It will automatically



hold a long spindle in perfect alignment during the loading operation. As illustrated, this has been done by means of an upside-down version of a conventional arbor press.

Over-all dimensions of the 20-ton Clair model L are: 7 ft 4 in. high, 2 ft 6 in. wide. The inside clearance is 60 in. high, 17¼ in. wide. Ram travel is 5 in. Clair Mfg. Co. Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 4

Resin

. . .epoxy based

Supplied as a syrupy liquid, hardener is added before it is used. Sufficient metal powder is

added to attain the proper viscosity for the particular application. Powders include iron, magnesium, aluminum, zinc, bronze and brass. It is applicable to nonferrous and ferrous metals. Viscosity can be controlled from a thin liquid to a heavy putty like paste. It is easily handled and will cure in a few hours, without shrinkage, at room temperature. It is impervious to all acids, alkalies, oils, grease, etc., and is to be used to eliminate sand pits, small gas holes, shrinkage, cracks, deep nicks and scratches, machining flaws and porous areas in precision metal parts. Carl H. Biggs Co. Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 5

Sigma Spot Welding

. . . uses filler metal

This torch can make extra-strong spot welds on metals up to ⅛ in. thick—plug and tack welds on metals up to ¼ in. thick. A consumable wire electrode, feeding into the weld area, acts as reinforcing filler metal.

The operator positions the nozzle of the torch on the work and squeezes the trigger. Current, water and argon flows start and shut off

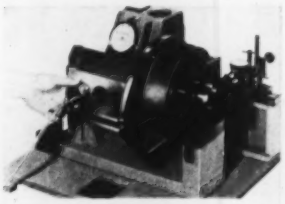
automatically. Welds are claimed to be uniform and smooth, requiring little or no finishing operation. Union Carbide & Carbon Corp.

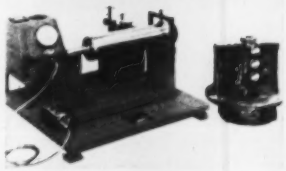
FOR MORE DATA CIRCLE REPLY CARD NO. 6

Air-Hydraulic Cylinder

. . . for smooth control

This cylinder has been developed to provide smoothness and precise control of hydraulic power from any shop air supply. Of coaxial design, it surrounds the oil cylinder in the coaxial unit, avoiding excessive length. Expanding exhaust air helps cool the oil to assure dependable operation.





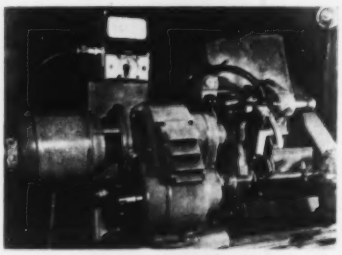
Automatic models are available with built-in controls for speed, direction, traverse and automatic recycling. Standard models can be remotely controlled with conventional valving and piping. The unit develops hydraulic piston thrust of 3.14 x airline pressure and pull of 2.7 x air pressure. Modernair Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 7

Electronic Micrometer

. . . automatic

This gage is capable of automatically controlling a grinding machine's cycle and guaranteeing tolerances as low as 0.00005 in. It was developed to get high quality work from semiskilled labor.



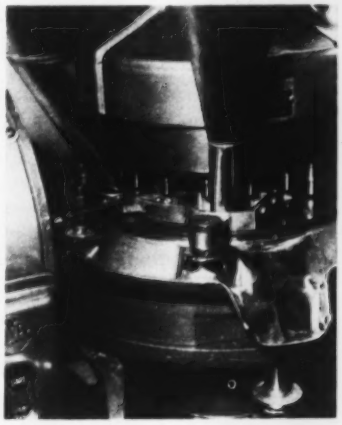
The standard model Autosizer is about the size of a shoebox. It self-compensates for wear and other outside influences, including temperature and moisture changes. It can be adapted to almost any machine (set-up time is about 15 minutes). When the piece is down to final size, the wheel retracts automatically. Industrial Gauges Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 8

Multi-Layer Components

. . . for stroke press

This rotary tabletting press can make tablets of more than one layer, permitting two or three different materials to be compacted in the same tablet. Virtually any combination of materials can be compacted so long as they will adhere after sintering or firing. The ratio thickness of one layer to another can vary for 1:1 to 1:3.



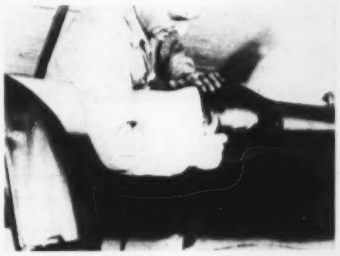
The multi-layer feature is available on a number of presses ranging from the B-2 16-station to the DDS2, 11-station model. Close-up of the press shows feed frames. F. J. Stokes Machine Co. Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 9

Pipe Covering

. . . prefabricated

Polyvinyl chloride acetate pipe cover finish protects against weather, abrasion, chemicals, mildew, etc. Protektinsul is furnished to exact size. Photo shows application of tape over insulated fitting. Coating (to left) zips and locks



over insulation, extending over end of taped fitting.

No maintenance is needed to remove stains that normally develop in service. Oil, rust or dirt

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A FEW OF THE MANY sizes and shapes of Anaconda Small-Diameter Tubes

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SMALL-DIAMETER TUBES

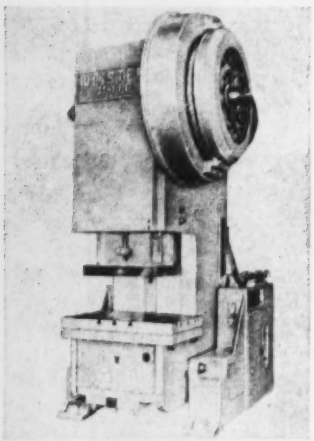
can be removed with a damp cloth. Miracle Adhesives Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 10

Gap Presses

. . . fabricated steel

One of the group of presses (illustrated) has a built-in panel leg control cabinet containing all electrical and lubrication controls for press or automation equipment. Single entrance connections for air and power permit quick connection for immediate operation or disconnection for fast relocation.



Massive steel frame sections increase compressive strength for minimum deflection and build up vibration dampening qualities. Slides have box type cast construction designed to eliminate way deflection. Some specifications: 110 ton presses have standard slide stroke of 5 in. with 80 to 105 strokes per minute on flywheel press or 37 strokes per minute on geared press; bed area 27 x 42; slide bed area 21 x 28. Minster Machine Co.

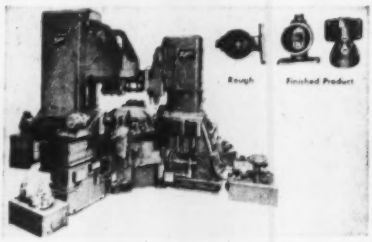
FOR MORE DATA CIRCLE REPLY CARD NO. 11

Special Machine

. . . electric check

Featuring an electronic mechanism for checking drill breakage, this seven-way special drill chamfers, spot faces and taps 377 master brake cylinders per hour. The power-operated automatic index table is 48 in. in diameter and is complete with shot bolt.

Following each cycle, drill checking arms swing sensing probes to and from two 0.028 in. diameter drills. If either drill is broken,



a failure light flashes on and the machine stops. Buhr Machine Tool Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 12

Combination Cleaner

. . . steam cleans faster

The improved model 250 high pressure cleaner produces pressures up to 300 psi. It uses a pump for pressure instead of steam, enabling the user to get 300 lb of pressure without lighting the burner. Two valves on the control panel permit a shift instantly to any of the five cleaning actions. The burner is constructed so the flame does not hit the coils.

The manufacturer recommends the model for all heavy cleaning, such as removal of caked mud, dirt and grease, oils, asphalts, ice deposits, loosening of old paint, cleaning and degassing of oil and chemical tanks. Gas-fired units are stationary. Oil-fired units may be stationary, caster-mounted or trailer-mounted. Malsbary Mfg. Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 13

Emulsion Cleaner-Degreaser

. . . dust-free powder

Kelite MD-1, freely soluble in water, exhibits high surface activity and great cleaning efficiency in the removal of protective mill oil from steel. It is used as a tank immersion cleaner at 160 to 180° F. The cycle employed is 0.5 to 3 minutes, depending on amount and tenacity of soil present. It is especially effective when using the Keykote process to deposit a molybdate coating.

Strongly buffered, it exhibits a fairly constant pH over a range of concentration. Kelite Products Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 14

Folding Pyramid Box

. . . permits stacking

This shipping container combines the structural strength of steel tubular rack with the desirable features of the wire mesh container. Nesting design permits tiering. Each folded unit stands 15¾ in. high. The container is offered in two standard sizes—40 x 48 x 24 in. and 32 x 40 x 24 in. Each unit has 2-ton capacity.

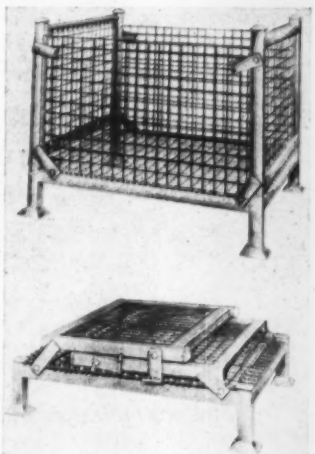


Illustration shows the unit folder down and open. The X frame base provides entry from all sides. Its construction permits handling of larger loads with fork trucks. Paltier Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 15

Tractor

. . . with universal grip

Industrial trailers can be coupled or uncoupled in two seconds with this operator-led tractor with a universal grip. It will couple to any trailer of 5½ to 12¾ in. clearance from the floor. Coupling is accomplished by a hydraulically-operated draw bar. The operation

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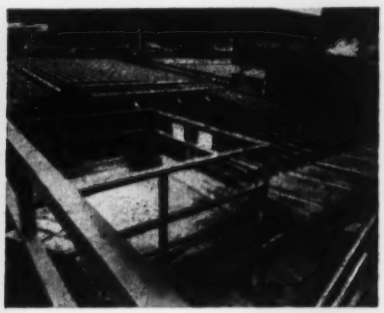

Courtesy Jones & Laughlin Steel Corp.

Bar and billet mill cooling beds capable of handling up to and including 5" square bars or billets up to and including 35' in length.

Beds are approximately 120' in length overall.

Bars or billets can be deposited on the beds alternately as fast as they are delivered from the mill.

Treadwell Engineering Company

EASTON, PA.

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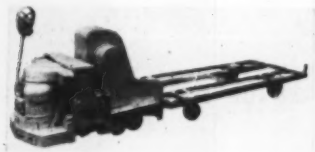
PITTSBURGH 22, PA.
ATlantic 1-2883

is governed by a single button in the operating handle. Bar is 5½ in. wide with a 12 in. retracting action. Pull is 175 lb normal and 800 lb ultimate.



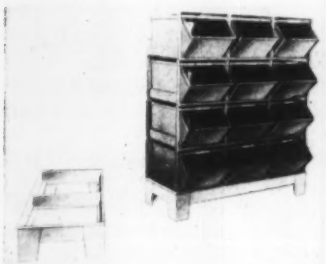
Overall length of Uni-Grip with draw bar retracted is 61½ in.; over-all width is 30 in. Maximum trailer load is 6000 lb. Automatic Transportation Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 16

Movable Base

. . . for load handling

They were made to hold different quantities and all sizes of Stackbin-Stackrack combinations. The units lock to the bases for



handling by fork trucks, making possible unit load handling of production line supplies.

Under-clearance of 8½ in. leaves ample room for cleaning and permits fork truck handling. Stackbin Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 17

Portable Electric Drill

. . . variety of uses

The model 137 drill is run by a universal ac-dc, 115-V motor which

has spur-type reduction gears. Its idling speed is 2300 rpm. A precision ground gear-type chuck prevents slipping. A trigger switch, with pushbutton locking, is in the handle.

Using high speed twist drills, it penetrates steel and other metals, plastics and concrete. With abrasive discs, it sands metal, removes paint and varnish. A wire brush attachment removes rust. A special bracket and grinding wheel convert it into an electric bench grinder. A 5-in. lamb's wool bonnet equips the drill for waxing and polishing, and a cloth buff enables it to polish metal articles. Porter-Cable Machine Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 18

Water-Cooling System

. . . added to presses

Circulation of cold water within the press frame, prevents overheating while in constant use. Avoiding overheating eliminates the possibility of softening thermoplastic material clamped down for positioning and prevents the frame from being jammed or bound by

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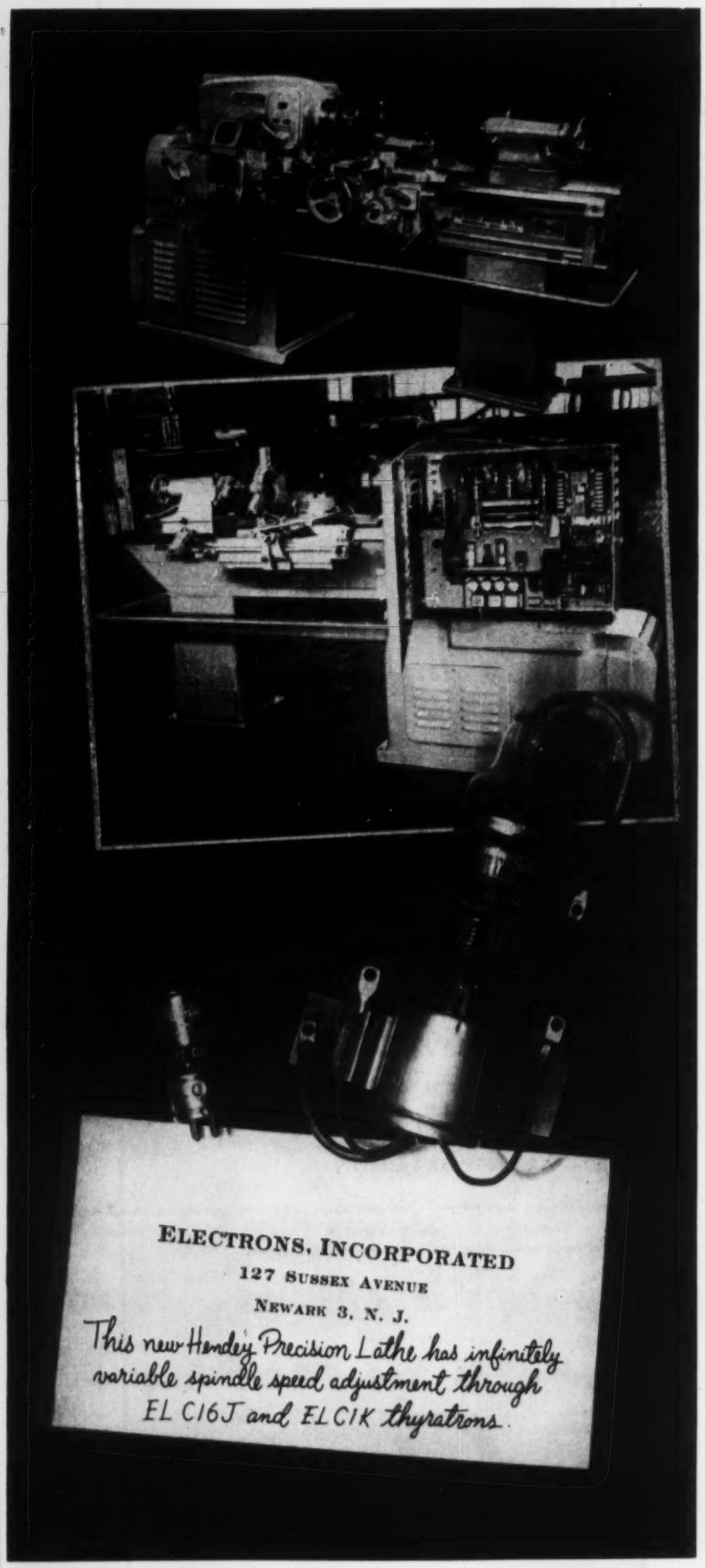

ELECTRONS, INCORPORATED
127 SUSSEX AVENUE
NEWARK 3, N. J.
This new Hendey Precision Lathe has infinitely variable spindle speed adjustment through EL C16J and EL C1K thyratrons.

metal expansion.

This water-cooling feature will be included on all equipment and can be added to existing Vac-Form equipment in most cases. Vacuum Forming Corp.

FOR MORE DATA CIRCLE REPLY CARD NO. 19

Spray Lubrication

. . . for abrasive belts

Excelene grinding and polishing oils are available in 12-oz pressurized cans. It is clean and easy

for operators to handle and apply.

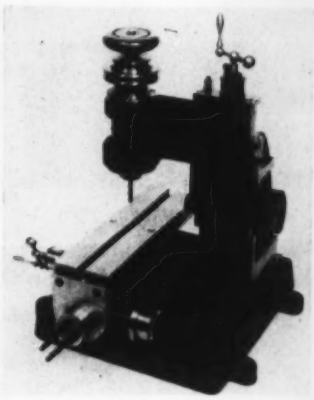
Excelene NF is used with nonferrous metals, Excelene FD, with ferrous metals. D. A. Stuart Oil Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 20

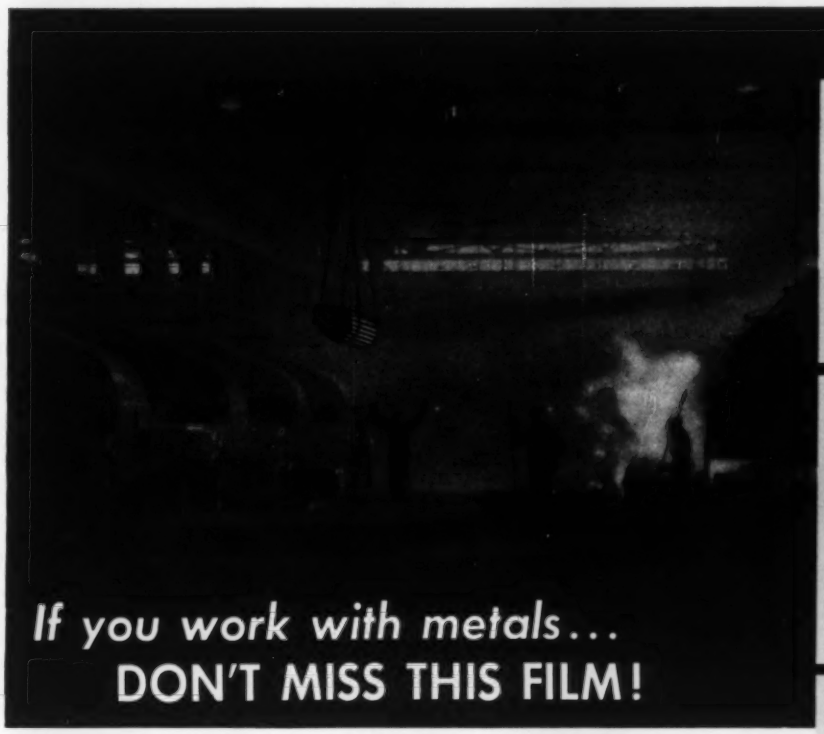
Micromill

. . . for precision work

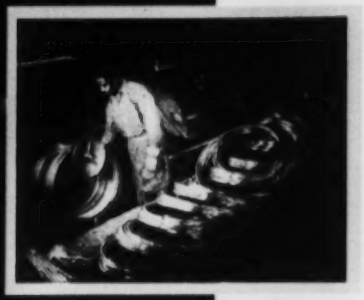
The machine has been redesigned to provide four position



stops in each direction and accurate hole location on small jig boring work. The micromill will handle milling, drilling, reaming, tapping, counterboring, spot facing and grinding. To space a number of holes accurately, the stop is set and the workpiece



If you work with metals...
DON'T MISS THIS FILM!



The prize-winning 16 mm color movie— "THE SCIENCE OF MAKING BRASS"

"In 30 minutes I learned more about making brass than in a day's trip through the mill."

That's a typical reaction to this dramatic Chase film! "The Science of Making Brass" takes you on a guided tour of Chase mills—shows you exciting, full-color close-ups of every step in the making of brass and other copper alloys in the form of sheet, rod, wire and tube. If *you* work with metals, it's an experience you won't want to miss!

"The Science of Making Brass" is a 16 mm, full-color film with a running time of 29 minutes, and will be loaned to you on request. To arrange a showing, clip and mail the coupon below.

It won these PRIZES First Prize, International Competition for Technico-Industrial Documentary Films, Turin, Italy and Venetia Diploma at Venice Festival.

It won this PRAISE "Far superior..." (Colorado manufacturer) "Excellent in every respect..." (Large eastern manufacturer) "Finest ever seen..." (Texas distributor).

Chase ®

BRASS & COPPER CO.

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

The Nation's Headquarters for Brass & Copper (†sales office only)

Albany†	Chicago	Denver†	Indianapolis	Minneapolis	Philadelphia	St. Louis
Atlanta	Cincinnati	Detroit	Kansas City, Mo.	Newark	Pittsburgh	San Francisco
Baltimore	Cleveland	Grand Rapids†	Los Angeles	New Orleans	Providence	Seattle
Boston	Dallas	Houston	Milwaukee	New York	Rochester†	Waterbury

To: Chase Brass & Copper Co., Incorporated
Waterbury 20, Conn., Dept. ST-1254

Gentlemen:

_____ *Please send me more information on your 16 mm, full-color film, "The Science of Making Brass."*

_____ *I would like to arrange for a showing on or about*

_____

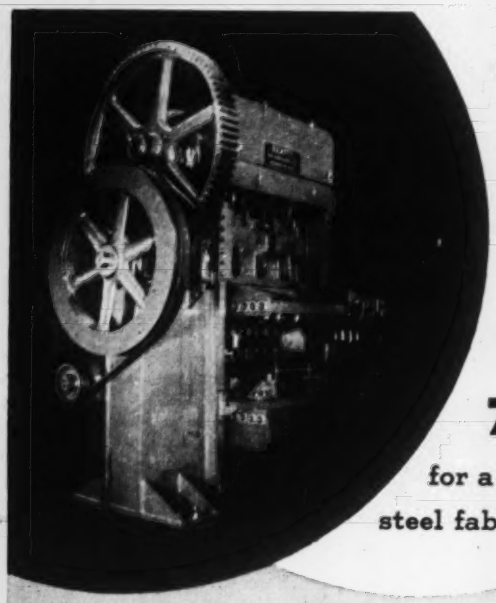
NAME _____

POSITION _____

FIRM _____

ADDRESS _____

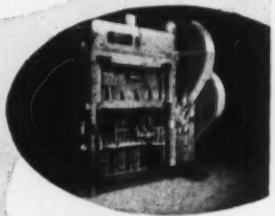
CITY _____ STATE _____



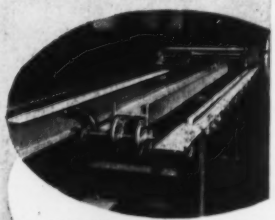
This Beatty Punch CUT COSTS 75%

for a structural steel fabricator

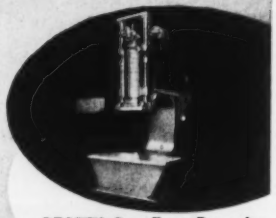
One of our present-day satisfied customers formerly employed machinery using only one punch for punching structural steel shapes. After consulting a BEATTY engineer, this firm installed a BEATTY Guillotine Beam Punch with an adjustable tooling feature that enables them to perform exact repeats of multiple punch patterns in 25% of the time formerly required. Naturally, we can't guarantee such substantial savings in every industrial installation of BEATTY machines! But, if you're currently considering additional production machinery for your metal fabricating plant, better see a BEATTY engineer before making any final decisions! Chances are he'll have an idea or two on how you can achieve greater production economies with BEATTY Machines!



BEATTY Guillotine Beam Punches are available for punching webs and flanges in "I" beams from 6" to 30".

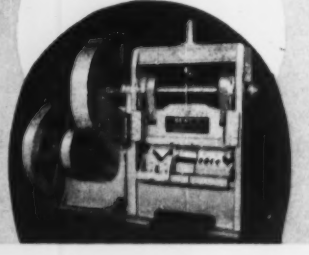


BEATTY Spacing Table handles web and flange punching without roll adjustment.



BEATTY Gap Type Press for forming, bending, flanging, pressing. Capacity 250 tons.

BEATTY
Guillotine Bar Shear for angles, bars, rounds, squares without changing tools.



BEATTY
Machine & Mfg. Company
HAMMOND, INDIANA

NEW PRODUCTS and equipment

centered to drill or cutter.

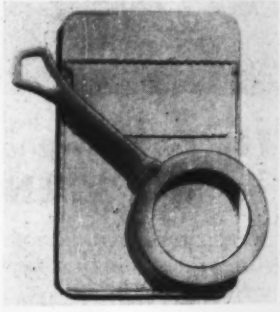
The headstock has preloaded duplex bearings. With speeds up to 20,000 rpm, designers claim a spindle runout of less than 0.0001 in. at the mouth of the spindle. A standard Magnus chuck (capacity from 0.004 to 0.315 in.) or a No. 1A Jacobs drill chuck (capacity ¼ in.) can be used to hold drills or other tools. F. W. Derbyshire Inc.

FOR MORE DATA CIRCLE REPLY CARD NO. 21

Tension Tester

. . . for surface measurements

The Jiffy-Loop is used to control surface tensions of all solutions up to 200° F. The loop is immersed into the solution, swished around and withdrawn



vertically. If film is intact on withdrawal, surface tension is correct for chosen range and temperature. If film is broken, surface tension is too low and a wetting agent must be added. Pollack Products Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 22

Electrical Plastic Tubing

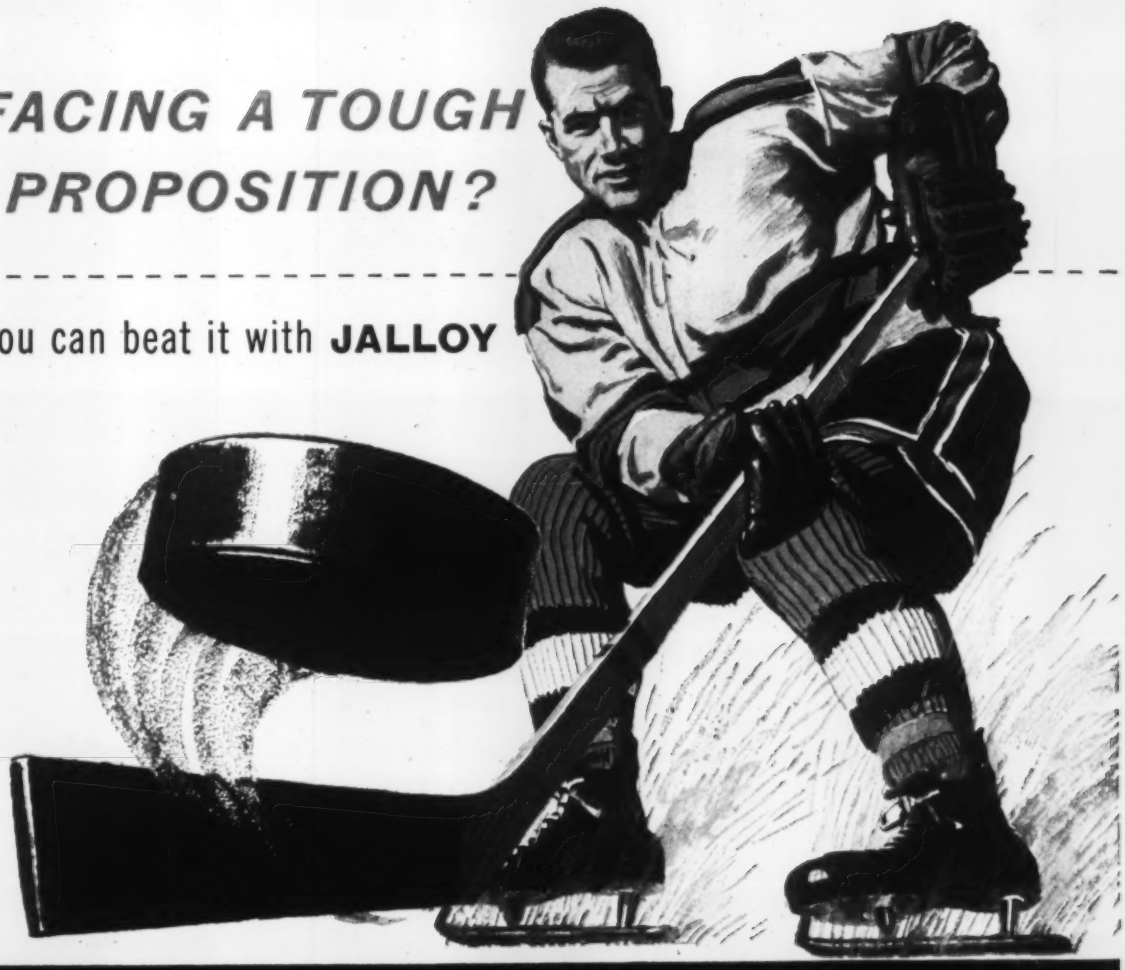
. . . improved formulation

Temflex 105 plastic tubing's modified formulation provides im-

provement in heat deformation characteristics and greater resistance to cut-through. It is used

FACING A TOUGH PROPOSITION?

you can beat it with **JALLOY**



J&L JALLOY HEAT-TREATED PLATE BEATS WEAR DUE TO ABRASION

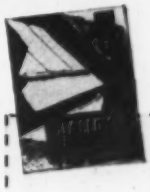
J&L Jalloy Heat-Treated Plate is the special purpose steel that is heat treated to provide longer wear on applications where impact and abrasive conditions are severe.

In comparison with other abrasion-resistant steels as well as mild steels, it gives optimum results when heat treated to a Brinell hardness of 340 and up. Jalloy permits savings in steel costs, maintenance, and repair. Furthermore, it is easily welded.

Jalloy is available in three grades to meet various service requirements.

J&L STEEL

Jones & Laughlin
STEEL CORPORATION — *Pittsburgh*



Complete data concerning CHEMICAL COMPOSITION . . . HEAT TREATMENT . . . WELDABILITY . . . PHYSICAL PROPERTIES . . . will be mailed to you promptly. Write today.

Jones & Laughlin Steel Corporation
3 Gateway Center, Dept. 404, Pittsburgh 30, Pa.

☐ Please mail complete data concerning Jalloy.
☐ Please have your representative call.

Name_____ Title_____

Company_____

Address_____

_____

for a fabulous finish...

Jewel Brand

ABRASIVE BELTS

in all grits and widths for grinding, sanding, polishing metal, wood, leather, plastics, rubber.

ABRASIVE PRODUCTS, INC.
511 Pearl Street
South Braintree 85
Massachusetts

NEW PRODUCTS and equipment

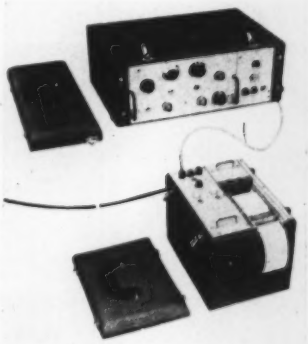
extensively by electrical equipment and electronic manufacturers and is approved by Underwriters' Laboratories for continuous operation at 105°C. Minnesota Mining & Mfg. Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 23

Recording System

. . . single channel

The 150 series utilizes plug-in preamplifiers, permitting simple changeover from one type of recording to another. Seven availa-



ble preamplifiers plug into a driver amplifier-power supply unit housed in a carrying case. A simple patch cord connection couples it to the separately-housed recorder.

The system makes inkless recordings in true rectangular coordinates, at paper travel speeds of 5, 10, 25, 50 and 100 mm/sec. Notations can be made on the chart (it's clearly visible) during recording. Units are compact and portable. Sanborn Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 24

Conveyor Belt

. . . non-skid surface

It will carry packages up grades as steep as 45 degrees. Small grippers on its rubber cleats (there are about 960 per sq ft) hold packages of all kinds firmly. Heavy cases won't tear them loose because of the belt's molded construction.

Water runs off the Para-Lift easily and it throws out dirt and other foreign material as it flexes over pulleys. The belt comes in widths up to 48 in. New York Belting & Packing Co.

FOR MORE DATA CIRCLE REPLY CARD NO. 25

FREE LITERATURE

Catalogs and Clip Sheets

Use these reply cards to bring you free literature, editorial clips or more information on new products and equipment described or advertised in this issue.

Welding

Lincoln Electric Co. offers a reprint of three articles on principles that help the practical design of welded steel machine parts and machinery.

FOR A FREE COPY CIRCLE REPLY CARD NO. 26

Alloy Tool Bits

Allegheny Ludlum Steel Corp. has revised its technical information bulletin on ALX alloy tool bits in the cutting range between high speed steel and carbides.

FOR A FREE COPY CIRCLE REPLY CARD NO. 27

Gear Checkers

Michigan Tool Co. describes its line of Sine-line involute gear checkers—Bulletin MIC-54.

FOR A FREE COPY CIRCLE REPLY CARD NO. 28

Digital Instruments

Brush Electronics Co. describes five related digital instruments for automatic counting, recording and control—4 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 29

Precision Instrument Production

Daco Machine & Tool Co.'s "Daco Doings" tells how they are equipped to handle the design, tooling and production of high-precision instruments—20 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 30

Comparator

Portman Instrument Co. Inc. offers information on its new economy size optical comparator, the Target duplex shadowgraph.

FOR A FREE COPY CIRCLE REPLY CARD NO. 31

Quenching Oil

Sun Oil Co. covers quenching Oil No. 11 which is said to be ideal for systems requiring high flash-point.

FOR A FREE COPY CIRCLE REPLY CARD NO. 32

Company History

Worcester Pressed Steel Co. traces its 50 years in, "The Lively Life and Times of Presteel."

FOR A FREE COPY CIRCLE REPLY CARD NO. 33

Servicing Gears

Westinghouse Electric Corp.'s latest issue of *Maintenance News* carries an article on servicing gears.

FOR A FREE COPY CIRCLE REPLY CARD NO. 34

Screw Lock Insert

Heli-Coil Corp. selection tables, line drawings show proper installation in blind and through holes and instructions on use of its new screw-lock insert — Bulletin 715-A, 4 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 35

Temperature Control

Minneapolis-Honeywell Regulator Co. offers technical data on automatic temperature control for induction heating equipment—Bulletin No. HT-1, 16 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 36

Certified Lighting

National Lighting Bureau describes the industrial and commercial relighting promotion program being launched nationally — 19 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 37

Printed Circuitry

National Vulcanized Fibre Co. shows the advantages of printed circuitry for electrical and electronic systems—12 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 38

Fasteners

John Hassall Inc. offers complete information on its special rivets, nails, screws and small parts. They're made by cold heading — Catalog No. 58, 11 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 39

Steel Squaring Shears

Columbia Division, Lodge & Shipley Co. offers four brochures: 1. Its line of squaring shears. 2. Complete data on accessories. 3. Outstanding features of the power

For free literature, editorial clips or more information on products described in this section, circle the corresponding number at left. Fill in box below for articles or advertisements not numbered.

ARTICLE OR ADVERTISEMENT	PAGE

NAME _____ TITLE _____

COMPANY _____

PRODUCTS MANUFACTURED _____

ADDRESS _____

CITY AND STATE _____

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4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
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press brakes. 4. The Columbia hydraulic compression molding presses.

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Pallet Handling

Edison Storage Battery Division, Thomas A. Edison Inc., gives case histories describing pallet handling in *Storage Battery Power*—November Issue.

FOR A FREE COPY CIRCLE REPLY CARD NO. 41

Hammer Drill

Syntron Co. details its Model 27-RO electromagnetic hammer drills and other portable power tools—Catalog No. 5410, 25 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 42

Mold Release

Vin-Rock Inc. covers application methods, mold release characteristics, recommended uses, prices and shipping data on the Super XX mold release—Form No. 497.

FOR A FREE COPY CIRCLE REPLY CARD NO. 43

Boom

Maxwell Equipment Co. describes its hydraulically operated boom (Hydro Sky-Worker) that carries workers aloft and keeps them on a constant work basis—6 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 44

Lead Treated Steels

Copperweld Steel Co. tells how lead treated steels are produced. Production advantages and case histories are included—8 pages.

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Excavation

Hyster Co.'s 12-minute color film, "Design for Excavating," shows excavation and crane work with the Hyster Hystaway mounted on Caterpillar-built tractors.

FOR A FREE COPY CIRCLE REPLY CARD NO. 46

Unit Heaters

Industrial Unit Heater Assoc.'s "Piping, Trapping and Venting Steam and Hot Water Unit Heaters" gives diagrams and instructions for making most unit heater installations—Bulletin No. 15, 8 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 47

Statistics

British Columbia's Department of Trade and Industry offers facts and statistics on British Columbia—34 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 48

Design Facilities

East Coast Aeronautics Inc. covers design-through-production facilities in three basic lightweight materials—aluminum, magnesium and reinforced plastics—24 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 49

Proportioning Control

Leeds and Northrup Co. covers its Series 60 electric proportioning control for Speedomax Type G, Type H and Micromax—Folder ND4 (7a) 30-954, 13 pages.

FOR A FREE COPY CIRCLE REPLY CARD NO. 50

EDITORIAL REPRINTS:

Sky-high Aircraft

The world political situation means that the aircraft industry will continue to fly high in 1955, says the article on p. 57. It's one of America's biggest industries, with thousands of subcontractors. Are you one of them?

FOR A FREE COPY CIRCLE REPLY CARD NO. 51

Air Distribution

So often, complaints about air tools and compressors can be traced to faults in the air distribution system. On p. 100 you'll find some suggestions to help you build in enough power capacity to handle future needs.

FOR A FREE COPY CIRCLE REPLY CARD NO. 52

Porcelain Enameling

Study of the enameling process has turned up a promising area for improvement. They're trying automatic spraying machines to cut costs and improve products. On p. 104 you'll see what has been done.

FOR A FREE COPY CIRCLE REPLY CARD NO. 53

Scheduling

Linear Programming is gaining a growing list of disciples in metalworking plants. A tube mill got 15 per cent more out of its machines. Applied to phases of another operation, it saved about $350,000 annually. The article on p. 118 shows how you can use production planning to advantage.

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STEEL
December 13, 1954

Market Outlook

RELATIVELY high level steel operations (above 80 per cent) appear assured through the first quarter of next year. Orders are piling up on steel mill books as consumer pressure for tonnage rises in step with lengthening deliveries. The immediate outlook is for some slowing down in buying and operations over the Christmas holidays. But, despite this seasonal slackening, expectations are December output may equal, possibly surpass, November's, which was the first 8-million-ton production month in a year.

PRODUCTION—Steelmaking operations have increased for the seventh consecutive week, establishing a new high for the year. The national ingot rate stands at 81.5 per cent of capacity, up ½ point from the preceding week. Indications are a further slight gain may be achieved before the Christmas sag begins to be felt toward the close of next week.

AUTO FACTOR—There is no getting around the fact the current bulge in steel demand stems largely from resumption of large-scale automobile production. The more autos produced the more steel consumed. And since the automotive industry provides the largest single outlet for steel, it follows that should the new models being introduced catch on in a big way, strong demand for finished steel will be assured through first half.

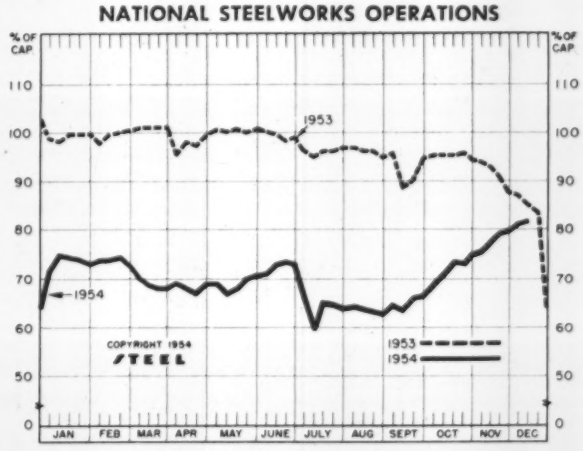
WEAK POINT—At the same time, however, while automotive buying is a towering factor of strength, it does not necessarily follow that a healthy market in steel is a certainty over coming months. In fact, if there is any weak point in the present situation, it is imbalance in requirements among consumption outlets and mill product mix.

Such consuming lines as appliances have been buying steel on a rising scale over recent weeks. But while some of this demand mirrors better order situations of these consumers, a substantial portion of it is "scare" buying arising from lengthening deliveries in the face of depleted inventories. In some cases this is leading to the placing of tonnage with mills beyond requirements in sight, lending to a build-up of backlogs that could wash out quickly in event demand for the new model autos fails to come up to expectations—or hopes.

PRODUCT MIX—In the present situation demand is heavily weighted in favor of the light, flat-rolled products. Such heavy items as plates continue to move at an extremely sluggish pace and are available for almost immediate shipment from the producing mills. Bars are in somewhat heavier demand but still can be had for fairly prompt shipment. Building steel, such as structurals and reinforcing, is moving fairly well but the normal seasonal decline is beginning to be felt. Railroad and ship steel requirements continue disappointing.

Clearly, such imbalance in the market leaves much to be desired for stability. Under existing circumstances, continuance of the present accelerated activity in steel depends too much on the way retail sales of automobiles develop. Fortunately, prospects are considered promising for an upturn in demand for the heavy products come January and February.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged)

	Week Ended Dec. 12	Change	Same Week 1953	Same Week 1952
Pittsburgh	77	— 1.5*	89	104
Chicago	90	— 1*	96	109
Mid-Atlantic	74	+ 2	87	101
Youngstown	86	0	88	106
Wheeling	96	+ 5.5	83	100
Cleveland	96.5	+ 7*	86	106.5
Buffalo	100	0	100	106.5
Birmingham	65.5	+ 1.5	96.5	106
New England	67	— 3	80	90
Cincinnati	68	— 3.5	71	93
St. Louis	80	— 3	83.5	96
Detroit	74	— 6	97.5	108
Western	83	— 1	90	107
National Rate	81.5	+ 0.5	85	105

INGOT PRODUCTION‡

	Week Ended Dec. 12	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	121.0†	120.8	116.7	121.7
NET TONS (In thousands)	1,944†	1,941	1,874	1,955

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,384,549 in 1954; 2,254,459 in 1953; 2,077,040 in 1952.

Metalworking Outlook—p. 49 Technical Outlook—p. 99

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Dec. 7 1954	Nov. 30 1954	Month Ago	Nov. Average
(1947-1949=100)	144.7	144.7	144.7	144.7

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Dec. 7

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.525
Rails, light, 40 lb	5.917
Tie Plates	5.275
Axles, railway	7.500
Wheels, freight car, 33 in. (per wheel)	48.500
Plates, carbon	4.675
Structural Shapes	4.517
Bars, tool steel, carbon (lb)	0.430
Bars, tool steel, alloy, oil hardening die (lb)	0.525
Bars, tool steel, H.R., alloy, high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.80 (lb)	1.115
Bars, tool steel, H.R., alloy, high speed W 18, Cr 4, V 1 (lb)	1.610
Bars, H.R., alloy	8.775
Bars, H.R., stainless, 303 (lb)	0.418
Bars, H.R., carbon	5.000
Bars, reinforcing	5.050
Bars, C.F., carbon	8.160
Bars, C.F., alloy	11.275
Bars, C.F., stainless, 302 (lb)	0.433
Sheets, H.R., carbon	4.880
Sheets, C.R., carbon	5.871
Sheets, galvanized	7.220
Sheets, C.R., stainless, 302 (lb)	0.548
Sheets, electrical	$9.350
Strip, C.R., carbon	7.507
Strip, C.R., stainless, 430 (lb)	0.416
Strip, H.R., carbon	5.125
Pipe, black, buttweld (100 ft)	15.000
Pipe, galv., buttweld (100 ft)	18.605
Pipe, line (100 ft)	146.804
Casing, oil well, carbon (100 ft)	154.216
Casing, oil well, alloy (100 ft)	227.875
Tubes, boiler (100 ft)	‡
Tubing, mechanical, carbon	‡
Tubing, mechanical, stainless, 304 (100 ft)	161.193
Tin plate, hot-dipped, 1.25 lb	8.533
Tin plate, electrolytic, 0.25 lb	7.233
Black plate, can making quality	6.333
Wire, drawn, carbon	7.938
Wire, drawn, stainless, 430 (lb)	0.546
Bale ties (bundle)	5.860
Nails, wire, 8d common	7.815
Wire, barbed (80-rod spool)	7.109
Woven wire fence (20-rod roll)	16.815

‡Not available.

STEEL's FINISHED STEEL PRICE INDEX*

	Dec. 8 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	194.53	194.53	194.53	189.74	152.52
Index in cents per lb.	5.270	5.270	5.270	5.140	4.132

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$117.95	$117.95	$117.95	$114.95	$91.64
No. 2 Fdry, Pig Iron, GT	56.64	56.64	56.64	56.64	46.10
Basic Pig Iron, GT	56.04	56.04	56.04	56.04	45.60
Malleable Pig Iron, GT	57.27	57.27	57.27	57.27	47.27
Steelmaking Scrap, GT	32.58	32.58	33.67	33.00	28.58

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	Dec. 8 1954	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.30	4.30	4.30	4.15	3.35
Bars, H.R., Chicago	4.30	4.30	4.30	4.15	3.35
Bars, H.R., deld. Philadelphia	4.55	4.55	4.55	5.302	3.83
Bars, C.F., Pittsburgh	5.40	5.40	5.40	5.20	3.95-4.00
Shapes, Std., Pittsburgh	4.25	4.25	4.25	4.10	3.25
Shapes, Std., Chicago	4.25	4.25	4.25	4.10	3.25
Shapes, deld. Philadelphia	4.53	4.53	4.53	4.38	3.50
Plates, Pittsburgh	4.225	4.225	4.225	4.10	3.40
Plates, Chicago	4.225	4.225	4.225	4.10	3.40
Plates, Coatesville, Pa.	4.225	4.225	4.225	4.35	3.50
Plates, Sparrows Point, Md.	4.225	4.225	4.225	4.10	3.40
Plates, Claymont, Del.	4.225	4.225	4.225	4.55	3.50
Sheets, H.R., Pittsburgh	4.05	4.05	4.05	3.925	3.25
Sheets, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Sheets, C.R., Pittsburgh	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Chicago	4.95	4.95	4.95	4.775	4.00
Sheets, C.R., Detroit	5.10	5.10	5.10	4.975	4.20
Sheets, Galv., Pittsburgh	5.45	5.45	5.45	5.275	4.40
Strip, H.R., Pitts.	4.05	4.05	4.05	4.425	3.25
Strip, H.R., Chicago	4.05	4.05	4.05	3.925	3.25
Strip, C.R., Pittsburgh	5.75	5.75	5.75	5.45	4.00
Strip, C.R., Chicago	5.85	5.85	5.85	5.70	4.00-4.15
Strip, C.R., Detroit	5.90	5.90	5.90	5.45-6.05	4.20-.25
Wire, Basic, Pitts.	5.75	5.75	5.75	5.525	4.15
Nails, Wire, Pittsburgh	6.85	6.85	6.85	6.55	5.15
Tin plate (1.50 lb), box, Pitts.	$9.05	$9.05	$9.05	$8.95	$7.75

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$78.00	$78.00	$78.00	$75.50	$61.00
Wire rods, ⅜-⅝" Pitts.	4.675	4.675	4.675	4.525	3.40

PIG IRON, Gross Ton

Bessemer, Pitts.	$57.00	$57.00	$57.00	$57.00	$47.00
Basic, Valley	56.00	56.00	56.00	56.00	46.00
Basic, deld. Phila.	59.66	59.66	59.66	60.75	49.44
No. 2 Fdry, Pitts.	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, Valley	56.50	56.50	56.50	56.50	46.50
No. 2 Fdry, deld. Phila.	55.16	55.16	55.16	61.25	49.94
No. 2 Fdry, Birm.	52.88	52.88	52.88	52.88	39.38
No. 2 Fdry (Birm.) deld. Cin.	60.58	60.58	60.58	60.43	46.08
Malleable, Valley	56.50	56.50	56.50	56.50	46.50
Malleable, Chicago	56.50	56.50	56.50	56.50	46.50
Ferromanganese, Duquesne	190.00†	190.00†	190.00†	200.00†	175.00*

*75-82% Mn, gross ton, Etna, Pa. †74-76% Mn, net ton.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pitts.	$32.50	$32.50	$34.50	$33.50	$32.00
No. 1 Heavy Melt, E. Pa.	32.25	32.25	33.50	33.00	24.75
No. 1 Heavy Melt, Chicago	33.00	33.00	33.00	32.50	29.00
No. 1 Heavy Melt, Valley	34.50	34.50	35.50	32.50	32.75
No. 1 Heavy Melt, Cleve.	32.50	32.50	33.50	30.50	30.25
No. 1 Heavy Melt, Buffalo	30.50	30.50	31.50	32.50	29.75
Rails, Rerolling, Chicago	52.50	52.50	54.50	46.50	43.50
No. 1 Cast, Chicago	39.50	39.50	39.50	33.50	42.50

COKE, Net Ton

Beehive, Furn, Connlsvl.	$13.75	$13.75	$13.75	$14.75	$13.25
Beehive Fdry, Connlsvl.	16.75	16.75	16.75	16.75	15.75
Oven Fdry, Chicago	24.50	24.50	24.50	24.50	20.00

Daily Nonferrous Price Record

	Price Dec. 8	Last Change	Previous Price	Nov. Avg.	Oct. Avg.	Dec. 1953 Avg.
Copper	30.00	Apr. 12	29.75-30.00	30.000	30.000	29.750
Lead	14.80	Oct. 4	14.55	14.800	14.775	13.300
Zinc	11.50	Sept. 3	11.00	11.500	11.500	10.000
Tin	90.125	Dec. 8	90.00	91.196	93.110	84.913
Nickel	64.50	Nov. 24, 1954	60.00	60.000	60.000	60.000
Aluminum	22.20	Aug. 5, 1954	21.50	22.200	22.200	21.500
Magnesium	27.00	Mar. 9, 1953	24.50	27.000	27.000	27.000

Quotations in cents per pound based on: Copper, deld. Conn. Valley; Lead, common grade, deld. St. Louis; Zinc, prime western, E, St. Louis; Tin, Straits, deld. New York; Nickel, electrolytic cathodes, 99.9%, base size at refinery unpacked; Aluminum, primary ingots, 99+ %, deld.; Magnesium 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.**
  Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.**
  Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.**
  Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.**
  Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**

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Nonferrous Metals

Civilian consumers will take 50,000 tons more aluminum this year than last. That means 1.3 million tons will go to civilian users out of a total output of 1,450,000 tons

Nonferrous Metal Prices, Pages 148 & 149

IF YOU STILL believe aluminum is primarily a military metal, better revise your thinking.

It has become a full-fledged civilian material—so much so that a 200,000 ton drop in defense shipments since the end of the Korean War has squeezed the industry hardly at all.

Ten Per Cent—Of the 1,450,000 tons of aluminum that will be shipped in 1954, according to Business & Defense Services Administration estimates, only 150,000 tons will go into direct military purposes. That's only 10.3 per cent of total shipments and a decrease from the 12.5 per cent (200,000 tons) that was consumed by military products last year. In 1952, 30 per cent of aluminum products shipments went to defense and AEC, compared with 25 per cent in 1951 and only 5 per cent in 1950.

Civilian industries will receive 50,000 tons more aluminum this year than last, a total of 1.3 million tons. Total shipments in 1954 are pegged at 1,450,000 tons, off slightly from the 1.6 million tons shipped in 1953. The decrease is entirely in the defense goods area.

Free Again—Particularly encouraging in the civilian outlook, according to Dr. George Perkins, director of BDSA's Aluminum and Magnesium Division, is that 1954 is the first full year since Korea which permitted unlimited use of aluminum without government control.

Remarkable in the gain is that it was in the face of two obstacles. According to Dr. Perkins: "A portion of last year's shipments went toward increasing inventories; in addition, several sectors of the civilian economy were operating below 1953 levels throughout most of 1954."

Outlook—Primary aluminum production in the U. S. is estimated by the agency at 1,450,000 tons, with high rates of secondary recovery and brisk imports contributing to supply. Bulwarks of use were construction which is gobbling up increasing amounts of the light metal; growth of foil for packaging and household applications; greater application in air conditioning, refrigeration and freezers; expansion of use in outdoor furniture and irrigation pipe systems; and introduction into home workshops.

Automotive and other transportation fields, electrical, electronic and communications products, utensils and a variety of commercial equipment and houshold appliances also contributed to the heavy intake.

Distributor Sales Up

Sales of aluminum by distributors are well above the corresponding period in 1953, Alcoa Vice President Don Wilmot told the fourth annual meeting of the National Association of Aluminum Distributors last week. He pointed out that architectural and building products run neck and neck today with transportation items as the leading field for aluminum sales. Other promising outlets for aluminum were seen in household appliances, air conditioning equipment, agricultural applications, bridge railings, highway signs and markers.

BIG FUTURE of titanium will be in the form of alloys, says John L. Holloway, president, Crane Co., which is building a $25 million plant near Chattanooga to produce $200 million in titanium yearly. Most commonly used alloy now contains 4 per cent aluminum and 4 per cent magnesium, says Mr. Holloway.

Aluminum producers should take a close look at the profit margin incentive provided the distributor, Burton L. Wolff, NAAD president, told the meeting. "Our surveys have shown that the gross margin of profit of all aluminum products sold by distributors averages about 20 per cent, while most steel products handled by warehouses and not sold on a mill parity basis will show a gross profit of from 25 to 30 per cent."

Some aluminum markets have been declining and must be recaptured, said Mr. Wolff, particularly the warm air heating and ventilating market. Potential large volume products offering the distributors sales opportunities are tubing, pipe and architectural shapes.

"Needed: More Light Metal"

More light metals production is needed, says Frank R. Nichols, Nichols Wire & Aluminum Co. "Volumetric comparison of light metals production capacity with steel production shows that light metals (aluminum, magnesium, titanium) represent only 4 per cent of steel production." Total tonnage of light metals (at peak capacity) is 1,678,000 tons; steel capacity on Jan. 1 was 124,330,410 tons. "The light metals (on a weighted average basis) weigh about two-thirds less than steel, so 5,034,000 tons of steel would be required to provide an equal volume of light metals."

New Market Memos

- Higher scrap prices and the boost in primary nickel sent brass and bronze ingot prices inching upwards last week. Up a half-cent were the 85-5-5-5 group, the yellow group and the nickel group. Demand is still lacking.
- Brass industry sales forecasters say the fourth quarter brass mill volume will rise 20 per cent over the third quarter level.
- Magnesium producers are facing the need for higher purity metal, emphasized by more use of magnesium as a chemical agent in other metallurgical processes, particularly in production of titanium and zirconium.
- Zinc markets are more active than lead for a change, with galvanizers, brass mills and die casters all taking healthy quantities.
- Nickel hijacking is becoming a popular way to get rich. Trucks bringing the metal in from Canadian refineries are being looted in the Buffalo area.
- Anaconda Copper will reopen its lead smelter in Utah. It is operated by its subsidiary, International Smelting & Refining Co.
- Weight savings of 1800 to 3000 lb are achieved by using 5154 aluminum alloy to make all-welded aluminum dump bodies for dump trucks instead of steel. Manufacturer is Penn Body Division, Hockensmith Corp., Penn, Pa. Aluminum bodies are especially useful for hauling coal because of the metal's resistance to attack by sulphur compounds.

AIRCRAFT-QUALITY ALLOY STEELS by Newport Steel

Manufacturers and subcontractors find Newport Steel a most dependable and economical source for highest quality aircraft alloy steel in plate, sheet and strip, including the popular chrome-molybdenum AISI 4130. Long famous for clean, sound, chemically accurate alloys, Newport today supplies ever-increasing tonnage for planes, guided missiles, Jato rockets and other vital defense products. All made on modern facilities, to exact specifications of government and manufacturer. From the heart of America's fastest-growing industrial area, Newport offers highest quality and prompt delivery. Let us tell you more!

PRODUCTS OF NEWPORT STEEL

- Hot-Rolled Steel in Coil
- Hot-Rolled Pickled Steel in Coil
- Electric Weld Line Pipe
- Hot-Rolled Sheets
- Galvanized Sheets
- Galvannealed Sheets
- Colorbond Sheets
- Hot-Rolled Pickled Sheets
- Electrical Sheets
- Alloy Sheets and Plates
- Roofing and Siding
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- Culverts

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A SUBSIDIARY OF MERRITT-CHAPMAN & SCOTT CORPORATION

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots 22.20, pigs 20.50 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 24; No. 43, 5% Si, 23.8; No. 142, 4% Cu, 25.1; No. 195, 4.5% Cu, 0.8% Si, 24.5; No. 214, 3.8% Mg, 25.2; No. 356, 7% Si, 0.3% Mg, 23.9.

Antimony: R.M.M. brand, 99.5% 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.; Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $40.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 30.00 deld. Conn. Valley, 30.00 deld. Midwest; Lake 30.00 deld.; Fire refined 29.75 deld.

Germanium: 99.9%, $295 per lb, nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $145-$150 per troy oz.

Lead: Common 14.80, chemical 14.90, corroding 14.90, St. Louis; N. Y. basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8%, self-palletizing pig 27.00; notched ingot 27.75, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., and Madison, Ill., add 1.20 for pig and 1.25 for ingot. Sticks 1.3 in. diameter, 46.00, 100 to 4999 lb f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more f.o.b. Freeport, Tex., or Madison, Ill. Add 1.20 for Port Newark, N. J

Mercury: Open market, spot, New York, $315-$320, per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked 64.50; 10-lb pigs, unpacked 67.65; "XX" nickel shot 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty, New York basis, add 0.92.

Osmium: $140-$150 per troy oz nom.

Palladium: $21 per troy oz.

Platinum: $84-$87 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $5-$6 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $39.00 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot 90.125, prompt 90.125.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max) $4.50, grade A-2 (0.5% Fe max) $4 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $4.95 per lb nom., f.o.b. shipping point; less than 1000 lb $5.10 nom.; 99+% hydrogen reduced, $4.65. Treated ingots $6.70

Zinc: Prime Western 11.50, brass special 11.75, intermediate 12.00, E. St. Louis, freight allowed over 0.50 per pound. High grade 12.85, special high grade 13.00, die casting alloy ingot 15.50, deld.

Zirconium: Sponge $10 per lb; powder electronics grade $15, flash grade $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloy 21.25-21.75; No. 12 foundry alloy (No. 2 grade) 20.25-20.75; 5% silicon alloy, 0.60 Cu max., 23.75-24.00; 13 alloy 0.60 Cu max., 23.75-24.00; 195 alloy 21.75-22.75; 108 alloy 20.75-21.25; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.50-22.00; grade 2, 20.50-21.00; grade 3, 19.50-20.00; grade 4, 18.50-19.00.

Brass Ingot: Red brass, No. 115, 30.00; tin bronze No. 225, 41.00; No. 245, 34.75; high-leaded tin bronze, No. 305, 34.00; No. 1 yellow, No. 405, 25.75; manganese bronze No. 421, 27.75

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 26.00; AZ91C, 31.50; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy.) Strip, $1.68; rod, bar, wire, $1.65.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb, 36.28; 30,000 lb. 36.53; l.c.l. 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $20.00 per cwt; pipe, full coils $20.00 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $11; forging billets $9; hot-rolled and forged bars, $9.

ZINC

(Prices per lb c.l., f.o.b. mill) Sheets 23.00, ribbon zinc in coils, 18.50-20.50; plates 18.00-22.25.

ZIRCONIUM

Plate $27; H.R. strip $28; C.R. strip $35; forged or H.R. bars $27; wire, 0.015 in., 1 cent per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	102	78	99
Strip, C.R.	102	87	125
Plate, H.R.	97	82	95
Rod, Shapes H.R.	87	69	93
Rod, Shapes C.R.	91	75	115
Seamless Tubes	122	108	153
Shot, Blocks		65	

ALUMINUM*

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	62.5	61.0	...	...
0.156-0.172	52.9	51.3	...	...
0.188	52.9	51.3	...	65.8
0.219-0.234	50.1	48.5	...	...
0.250-0.281	50.1	48.5	...	62.7
0.313	50.1	48.5	...	59.8
Cold-finished				
0.375-0.547	48.9	46.5	58.8	56.2
0.563-0.688	48.9	46.5	55.9	52.7
0.750-1.000	47.7	45.3	51.1	49.6
1.063	47.7	45.3	...	47.9
1.125-1.500	45.9	43.6	49.4	47.9
Rolled				
1.563	44.7	42.4	...	...
1.625-2.000	44.1	41.8	...	46.2
2.125-2.500	43.0	40.7	...	...
2.563-3.375	41.7	39.5	...	...

ALUMINUM*

Sheets and Circles: 1100 and 3003 mill finish c.l. (30,000 lb base; freight allowed over 499 lb)

Thickness Range Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	12-49	34.9	...	...
0.135-0.096	12-48	35.4	...	...
0.095-0.077	12-48	36.1	33.6	38.6
0.076-0.061	12-48	36.7	33.8	38.8
0.060-0.048	12-48	37.2	34.1	39.2
0.047-0.038	12-48	37.7	34.6	39.6
0.037-0.030	12-48	38.1	35.0	40.3
0.029-0.024	12-48	38.7	35.3	40.8
0.023-0.019	12-36	39.4	36.1	41.6
0.018-0.017	12-36	40.2	36.7	42.5
0.016-0.015	12-36	41.1	37.5	43.7
0.014	12-24	42.1	38.5	45.0
0.013-0.012	12-24	43.3	39.2	46.0
0.011	12-24	44.3	40.4	47.6
0.010-0.0095	12-24	45.5	41.5	49.2
0.009-0.0085	12-24	46.8	43.0	51.3
0.008-0.0075	12-24	48.4	44.2	53.1
0.007	12-18	49.9	45.7	55.4
0.006	12-18	51.5	47.1	60.4

*72-180 in. lengths. †26 in. max. dia.

ALUMINUM*

Plates and Circles: Thickness 0.250-3.0 in. 24-60 in. width or dia, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	34.7	38.9
5050-F	34.7	38.9
3004-F	35.7	40.6
5052-F	37.4	42.4
6061-T6	38.6	43.0
2024-T4*	40.8	46.9
7075-T6*	48.6	55.2

*24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM*

Forging Stock: Round, Class 1, 46.8-36.3, in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 52.6-40 in. random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 6063-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
⅜	$515.70	2	$ 48.30
1	24.75	4	132.90
1¼	23.50	6	238.35
1½	40.05	8	358.60

*Alloy designations are standard for use on and after Oct. 1, 1954. To relate them to designations used prior to that time, see STEEL, Aug. 9, 1954, p. 95.

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 94.00, 0.064-in. 73.00, 0.125-in. 60.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot rolled AZ31, 53.00, 20,000 lb or more 0.250-in. and over widths to 48 in., lengths to 144 in.; raised pattern floor plate, 59.00, 20,000 lb or more, ¼-in. thick, widths 24-72 in., lengths 60-192 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00. Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00. Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ¼-in. 67.00. Channels, 5 in. 67.80. I-Beams, 5 in. 66.20.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 28 clippings 14.50; low copper clippings 14.50; mixed clippings 12.50; old sheet 11.00; borings and turnings 7.50; pistons and struts 8.00; crankcases 11.00; industrial castings 11.00.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Steamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.76b	46.36c	....	48.82	26.000	26.000	25.250
Yellow Brass	42.27	42.21d	42.81	45.18	19.875	19.625	18.250
Red Brass, 85%	45.89	45.83	46.43	48.70	23.000	22.750	22.250
Low Brass, 80%	44.95	44.89	45.49	47.76	22.250	22.000	21.500
Naval Brass	46.39	40.70	53.43	49.55	18.500	18.250	17.750
Commercial Bronze, 90%	47.38	47.32	47.92	49.94	23.875	23.625	23.125
Nickel Silver, 10%	56.30	60.68g	58.63	....	24.125	23.875	12.063
Phosphor Bronze, A, 5%	67.31	67.81	67.81	68.96	26.500	26.250	25.250
Silicon Bronze	53.09	52.28	53.13	70.49e	25.125	24.875	24.125
Manganese Bronze	50.09	44.25	54.70	....	18.500	18.250	17.750
Muntz Metal	44.54	40.35	....	....	18.750	18.500	18.000

a. Cents per lb f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

Copper and Brass: Heavy copper and wire No. 1 26.00-26.50; No. 2 copper 24.50-25.00; light copper 22.50-23.00; No. 1 composition red brass 21.00; No. 1 composition turnings 20.50; mixed brass turnings 14.00; new brass clippings 18.00; No. 1 brass rod turnings 15.00; light brass 12.50; heavy yellow brass 15.50; new brass rod ends 16.00; auto radiators, unsweated 17.00; cocks and faucets 17.00; brass pipe 17.50.

Lead: Heavy 11.75-12.00; battery plate 6.25-6.50; linotype and stereotype 13.75-14.00; electrotype 12.00-12.50; mixed babbitt 12.50-13.00.

Magnesium: Clippings 18.50-19.50; clean castings 17.50-18.50; iron castings, not over 10% removable Fe, 16.50-17.50.

Monel: Clippings 23.00-25.00; old sheet 21.00-23.00; turnings 16.00-18.00; rods 23.00-25.00.

Nickel: Sheets and clips 60.00-65.00; rolled anodes 60.00-65.00; turnings 40.00; rod ends 60.00-65.00.

Tin: No. 1 pewter 55.00-60.00; block tin pipe 75.00-80.00; No. 1 babbitt 50.00.

Zinc: Old zinc, 5.00-5.25; new die cast scrap, 4.75-5.00; old die cast scrap, 3.25-3.50.

REFINER'S BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S, 3S clippings 15.75-16.00; 51S, 52S clippings 15.75-16.00; 14S, 17S, 24S clippings 15.00-15.25; mixed clippings 14.50-14.75; old sheet 13.75-14.00; old cast 13.75-14.00; clean old cable, free of steel 15.75-16.00; borings and turnings 14.00-14.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 28.50; No. 2 copper 27.00; light copper 25.50; refinery brass (60% copper) per dry copper content 25.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 28.50; No. 2 copper 27.00; light copper 25.50; No. 1 composition borings 23.25; No. 1 composition solids 23.50; heavy yellow brass solids 18.00-18.25 yellow brass turnings 17.00-17.25; radiators 19.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $1.70 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 5000-10,000 lb; electrodeposited 39.78, cast 42.04, 2000-5000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.085; 200-499 lb $1.07; 500-999 lb $1.065; 1000 lb or more $1.06.

Zinc: Bar 20.00, bar or flat top 19.00 ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 10,000 lb 28.50; over 10,000 lb 27.50.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-35,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 25,000 oz and over 77.325.

Sodium Cyanide: Egg, under 1000 lb 19.80; 1000-19,900 lb 18.80; 20,000 lb and over 17.80; granular, add 1-cent premium to above.

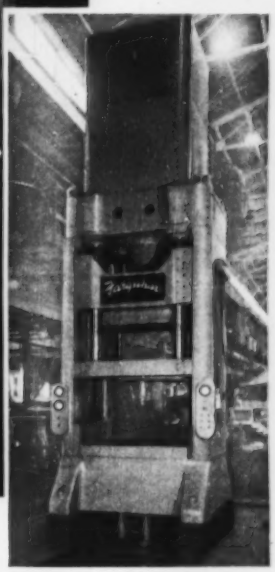
Sodium Stannate: Less than 100 lb 69.6; 100-600 lb 55.4; 700-1900 lb 53; 2000-9900 lb 51.2; 10,000 lb or more 50.1.

Stannous Chloride (Anhydrous): Less than 50 lb $1.551; 50 lb $1.211; 100-300 lb $1.061; 400-900 lb $1.037; 100-1900 lb $1.013; 2000-4900 lb 97.6; 5000-19,000 lb 91.5; 20,000 lb and over 85.4.

Stannous Sulphate: Less than 5 lb $1.252; 50 lb 95.2; 100-1900 lb 93.2; 2000 lb and over 91.2.

Zinc Cyanide: Under 1000 lb 54.30; 1000 lb and over 52.30.

Operator removing completed ceiling diffuser ring from Farquhar Hydraulic Press at Tuttle & Bailey, Inc., New Britain, Conn.



Tuttle & Bailey reports:

FARQUHAR HYDRAULIC PRESS Makes New Product Possible

Tuttle & Bailey, Inc., New Britain, Conn., produces heating convectors, ceiling diffusers, grilles, registers, etc., as well as several defense products for the United States. When production of the ceiling diffusers was first planned, the company found they could not be manufactured with existing equipment at their plant.

Tuttle & Bailey then consulted with various hydraulic press companies, searching for a design to meet their requirements. Finally, the A. B. Farquhar Company came up with the best design—*and at the lowest cost*—a 450-ton press with pressing ram speed of 0 to 45 in./min., approach and return speed of 390 in./min., and an operating hydraulic pressure of 2650 lbs./sq. in.

The company is very pleased with Farquhar's low maintenance cost, too. The press was installed in Aug. 1950, and has required no maintenance other than occasional gasket replacement.

Farquhar Presses Cut Your Costs

The above installation is just one more example of Farquhar performance in heavy production! Farquhar Presses are built-for-the-job . . . assure faster production due to rapid advance and return of the ram . . . greater accuracy because of extra-long guides on the moving platen . . . easy, smooth operation with finger-tip controls . . . longer life due to positive control of speed and pressure on the die . . . long, dependable service with minimum maintenance cost!

For our free catalog showing Farquhar Hydraulic Presses in all sizes and capacities for all types of industry, write to: The Oliver Corporation, A. B. Farquhar Div., Hydraulic Press Dept., 1522 Duke St., York, Pa.

Farquhar
HYDRAULIC PRESSES
for Bending • Forming • Forcing • Straightening • Assembling • Drawing
Extruding • Joggling • Forging • and other Metalworking Operations

THE OLIVER CORPORATION • A. B. FARQUHAR DIVISION

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; Key on page 151. Key to footnotes, page 153.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$61.50

INGOTS, Alloy (NT)

Detroit R7 .....$65.00
Houston S5 .....73.00
Midland,Pa. C18 .....65.00
Munhall,Pa. U5 .....65.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Aliquippa,Pa. J5 .....$64.00
Bessemer,Pa. U5 .....64.00
Buffalo R2 .....64.00
Clairton,Pa. U5 .....64.00
Ensley,Ala. T2 .....64.00
Fairfield,Ala. T2 .....64.00
Fontana,Calif. K1 .....72.00
Gary,Ind. U5 .....64.00
Johnstown,Pa. B2 .....64.00
Lackawanna,N.Y. B2 ..64.00
Munhall,Pa. U5 .....64.00
So.Chicago,Ill. R2, U5..64.00
So.Duquesne,Pa. U5 ...64.00
Youngstown R2 .....64.00

Carbon, Forging (NT)

Aliquippa,Pa. J5 .....$78.00
Bessemer,Pa. U5 .....78.00
Buffalo R2 .....78.00
Canton,O. R2 .....80.00
Clairton,Pa. U5 .....78.00
Conshohocken,Pa. A3 ..83.00
Ensley,Ala. T2 .....78.00
Fairfield,Ala. T2 .....78.00
Fontana,Calif. K1 .....86.00
Gary,Ind. U5 .....78.00
Geneva,Utah C11 .....78.00
Houston S5 .....85.00
Johnstown,Pa. B2 .....78.00
Lackawanna,N.Y. B2 ..78.00
LosAngeles B3 .....87.50
Munhall,Pa. U5 .....78.00
Seattle B3 .....91.50
So.Chicago R2,U5,W14 .78.00
So.Duquesne,Pa. U5 ...78.00
So.SanFrancisco B3 ...87.50

Alloy, Forging (NT)

Bethlehem,Pa. B2 .....$86.00
Buffalo R2 .....86.00
Canton,O. R2, T7 .....86.00
Conshohocken,Pa. A3 ..93.00
Detroit R7 .....86.00
Fontana,Calif. K1 .....105.00
Gary,Ind. U5 .....86.00
Houston S5 .....93.00
Ind.Harbor,Ind. Y1 ...86.00
Johnstown,Pa. B2 .....86.00
Lackawanna,N.Y. B2 ..86.00
LosAngeles B3 .....106.00
Massillon,O. R2 .....86.00
Midland,Pa. C18 .....86.00
Munhall,Pa. U5 .....86.00
So.Chicago, R2,U5,W14.86.00
So.Duquesne,Pa. U5 ...86.00
Struthers,O. Y1 .....86.00
Warren,O. C17 .....86.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 .....$96.50
Canton,O. R2 .....96.50
Cleveland R2 .....96.50
Gary,Ind. U5 .....96.50
So.Chicago R2, W14 ..96.50
So.Duquesne,Pa. U5 ...96.50

SKELP

Aliquippa,Pa. J5 .....4.00
Fontana,Calif. K1 .....4.775
Munhall,Pa. U5 .....3.90
Warren,O. R2 .....3.90
Youngstown R2, U5 ....3.90

WIRE RODS

AlabamaCity,Ala. R2 ..4.675
Aliquippa,Pa. J5 .....4.675
Alton,Ill. L1 .....4.85
Buffalo B11, W12 .....4.675
Cleveland A7 .....4.675
Donora,Pa. A7 .....4.675
Fairfield,Ala. T2 .....4.676
Fontana,Calif. K1 .....5.475
Houston S5 .....5.075
IndianaHarbor,Ind. Y1 .4.675
Johnstown,Pa. B2 .....4.675
Joliet,Ill. A7 .....4.675
KansasCity,Mo. S5 ....5.015
Kokomo,Ind. C16 .....4.775
LosAngeles B3 .....5.475
Minnequa,Colo. C10 ...4.925
Monessen,Pa. P7 .....4.675
No.Tonawanda,N.Y.B11 4.675
Pittsburg,Calif. C11 ...5.325
Portsmouth P12 .....4.675
Roebling,N.J. R5 .....4.775
So.Chicago,Ill. R2 .....4.675
Sterling,Ill.(1) N15 ....4.675
Sterling,Ill. N15 .....4.775
Struthers,O. Y1 .....4.675
SparrowsPoint,Md. B2..4.775
Torrance,Calif. C11 ...5.475
Worcester,Mass. A7 ...4.975

STRUCTURALS

Carbon Steel Stand. Shapes

Ala.City,Ala. R2 .....4.25
Aliquippa,Pa. J5 .....4.25
Bessemer,Ala. T2 .....4.25
Bethlehem,Pa. B2 .....4.30
Birmingham C15 .....4.25
Clairton,Pa. U5 .....4.25
Fairfield,Ala. T2 .....4.25
Fontana,Calif. K1 .....4.90
Gary,Ind. U5 .....4.25
Geneva,Utah C11 .....4.25
Houston S5 .....4.65
Ind.Harbor,Ind. I-2 ....4.25
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.85
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....4.95
Minnequa,Colo. C10 ....4.70
Munhall,Pa. U5 .....4.25
Niles,Calif. P1 .....4.80
Phoenixville,Pa. P4 .....3.95
Portland,Oreg. O4 .....5.00
Seattle B3 .....5.00
So.Chicago U5, W14 ....4.25
So.SanFrancisco B3 ....4.90
Torrance,Calif. C11 ....4.95
Weirton,W.Va. W6 .....4.25

Wide Flange

Bethlehem,Pa. B2 .....4.30
Clairton,Pa. U5 .....4.25
Fontana,Calif. K1 .....5.25
Lackawanna,N.Y. B2 ...4.30
Munhall,Pa. U5 .....4.25
Phoenixville,Pa. P4 .....3.95
So.Chicago,Ill. U5 .....4.25

Alloy Stand. Shapes

Clairton,Pa. U5 .....5.20
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.20
Houston S5 .....5.60
Munhall,Pa. U5 .....5.20
So.Chicago,Ill. U5 .....5.20

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 .....6.40
Bessemer,Ala. T2 .....6.40
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.40
Fairfield,Ala. T2 .....6.40
Fontana,Calif. K1 .....7.05
Gary,Ind. U5 .....6.40
Geneva,Utah C11 .....6.40
Houston S5 .....6.80
Ind.Harbor,Ind. I-2, Y1.6.40
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 ....7.00
Lackawanna,N.Y. B2 ...6.45
LosAngeles B3 .....7.10
Munhall,Pa. U5 .....6.40
Seattle B3 .....7.15
So.Chicago,Ill. U5, W14.6.40
So.SanFrancisco B3 ....7.05
Struthers,O. Y1 .....6.40

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ...6.45
Munhall,Pa. U5 .....6.40
So.Chicago,Ill. U5 .....6.40

PILING

BEARING PILES

Munhall,Pa. U5 .....4.25
So.Chicago,Ill. U5 .....4.25

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ...5.075
Lackawanna,N.Y. B2 ..5.075
Munhall,Pa. U5 .....5.075
So.Chicago,Ill. U5 ....5.075

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....4.225
Aliquippa,Pa. J5 .....4.225
Ashland,Ky.(15) A10 ..4.225
Bessemer,Ala. T2 .....4.225
Buffalo R2 .....4.225
Clairton,Pa. U5 .....4.225
Claymont,Del. C22 ....4.225
Cleveland J5, R2 .....4.225
Coatesville,Pa. L7 .....4.225
Conshohocken,Pa. A3 ..4.225
Ecorse,Mich. G5 .....4.375
Fairfield,Ala. T2 .....4.225
Fontana,Calif.(30) K1..4.875
Gary,Ind. U5 .....4.225
Geneva,Utah C11 .....4.225
GraniteCity,Ill. G4 ....4.425
Harrisburg,Pa. C5 .....3.975
Houston S5 .....4.625
Ind.Harbor,Ind. I-2, Y1.4.225
Johnstown,Pa. B2 .....4.225
Lackawanna,N.Y. B2 ..4.225
LoneStar, Tex. L6 .....4.55
Mansfield,O. E6 .....4.225
Minnequa,Colo. C10 ...5.075
Munhall,Pa. U5 .....4.225
Newport,Ky. N9 .....4.225
Pittsburgh J5 .....4.225
Riverdale,Ill. A1 .....4.225
Seattle B3 .....5.125
Sharon,Pa. S3 .....4.225
So.Chicago,Ill. R2 .....4.225
So.Chicago, R2,U5,W14..4.225
SparrowsPoint,Md. B2..4.225
Steubenville,O. W10 ...4.225
Warren,O. R2 .....4.225
Weirton,W.Va. W6 .....4.225
Youngstown R2,U5,Y1..4.225

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 .....6.025
Geneva,Utah C11 .....5.375

PLATES, Wrought Iron

Economy,Pa. B14 .....9.80

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland J5, R2 .....6.45
Conshohocken,Pa. A3 ...6.45
Ecorse,Mich. G5 .....6.60
Fairfield,Ala. T2 .....6.45
Fontana,Calif.(30) K1 ..7.15
Gary,Ind. U5 .....6.45
Geneva,Utah C11 .....6.45
Houston S5 .....6.85
Ind.Harbor,Ind. I-2, Y1.6.45
Johnstown,Pa. B2 .....6.45
Lackawanna,N.Y. B2 ...6.45
LosAngeles B3 .....7.35
Munhall,Pa. U5 .....6.45
Pittsburgh J5 .....6.45
Seattle B3 .....7.35
Sharon,Pa. S3 .....6.45
So.Chicago,Ill. U5, W14.6.45
SparrowsPoint,Md. B2 ..6.45
Youngstown U5, Y1 ....6.45

PLATES, Alloy

Claymont,Del. C22 .....5.80
Coatesville,Pa. L7 .....5.80
Fontana,Calif. K1 .....6.45
Gary,Ind. U5 .....5.80
Houston S5 .....6.20
Johnstown,Pa B2 .....5.80
Munhall,Pa. U5 .....5.80
Newport,Ky. N9 .....5.80
Seattle B3 .....6.70
Sharon,Pa. S3 .....5.80
So.Chicago,Ill. U5, W14.5.80
SparrowsPoint,Md. B2 ..5.80

FLOOR PLATES

Cleveland J5 .....5.275
Conshohocken,Pa. A3 ..5.275
Harrisburg,Pa. C5 .....5.15
Ind.Harbor,Ind. I-2 ....5.275
Munhall,Pa. U5 .....5.275
So.Chicago,Ill. U5 .....5.275

PLATES, Ingot Iron

Ashland c.l. (15) A10..4.475
Ashland l.c.l. (15) A10.4.975
Cleveland c.l. R2 .....4.825
Warren,O. c.l. R2 .....4.825

BARS

BARS, Hot-Rolled Carbon

Ala.City,Ala. R2 .....4.30
Aliquippa,Pa. J5 .....4.30
Alton,Ill. L1 .....4.50
Atlanta,Ga. A11 .....4.50
Bessemer,Ala. T2 .....4.30
Birmingham C15 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.40
Clairton,Pa. U5 .....4.30
Cleveland R2 .....4.30
Ecorse,Mich. G5 .....4.45
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
Fairless,Pa. U5 .....4.45
Fontana,Calif. K1 .....5.00
Gary,Ind. U5 .....4.30
Houston S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.90
Lackawanna,N.Y. B2 ..4.30
LosAngeles B3 .....5.00
Massillon,O. R2 .....4.40
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
N.Tonawanda,N.Y. B11..4.30
Pittsburg,Calif. C11 ....5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
Seattle B3, N14, P23....5.05
So.Chicago, R2,U5,W14..4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFran.,Calif. B3 ..5.05
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Warren,O. R2 .....4.30
Weirton,W.Va. W6 .....4.30
Youngstown R2, U5 ....4.30

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 .....5.075
Buffalo R2 .....5.075
Canton,O. R2, T7 .....5.075
Clairton,Pa. U5 .....5.075
Detroit R7 .....5.075
Ecorse,Mich. G5 .....5.225
Fontana,Calif. K1 .....6.125
Fairless,Pa. U5 .....5.225
Gary,Ind. U5 .....5.075
Houston S5 .....5.475
Ind.Harbor,Ind. I-2, Y1..5.075
Johnstown,Pa. B2 .....5.075
KansasCity,Mo. S5 .....5.675
Lackawanna,N.Y. B2 ..5.075
LosAngeles B3 .....6.125
Massillon,O. R2 .....5.075
Midland,Pa. C18 .....5.075
So.Chicago R2, U5, W14 5.075
So.Duquesne,Pa. U5 ...5.075
Struthers,O. Y1 .....5.075
Warren,O. C17 .....5.075
Youngstown U5 .....5.075

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.45
Bessemer,Ala. T2 .....6.45
Bethlehem,Pa. B2 .....6.45
Clairton,Pa. U5 .....6.45
Cleveland R2 .....6.45
Ecorse,Mich. G5 .....6.60
Fairfield,Ala. T2 .....6.45
Fontana,Calif. K1 .....7.70
Gary,Ind. U5 .....6.45
Houston S5 .....6.85
Ind.Harb.,Ind. I-2, Y1...6.45
Johnstown,Pa. B2 .....6.45
KansasCity,Mo. S5 .....7.05
Lackawanna,N.Y. B2 ...6.45
LosAngeles B3 .....7.15
Pittsburgh J5 .....6.45
Seattle B3 .....7.20
So.Chicago W14 .....6.45
So.Duquesne,Pa. U5 ....6.45
So.SanFrancisco B3 ....7.20
Struthers,O. Y1 .....6.45
Warren,O. R2 .....6.45
Youngstown U5 .....6.45

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 .....4.45

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....4.30
Atlanta A11 .....4.50
Fontana,Calif. K1 .....5.00
Niles,Calif. P1 .....4.85
Portland,Oreg. O4 .....5.05
SanFrancisco S7 .....4.70

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 .....5.20
Gary,Ind. U5 .....5.20
Houston S5 .....5.60
KansasCity S5 .....5.80
Youngstown U5 .....5.20

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12, R2 5.40
Buffalo B5 .....5.45
Camden,N.J. P13 .....5.85
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7, C20 .....5.40
Detroit R7 .....5.40
Detroit B5, P17 .....5.60
Donora,Pa. A7 .....5.40
Elyria,O. W8 .....5.40
FranklinPark,Ill. N5 ....5.40
Gary,Ind. R2 .....5.40
GreenBay,Wis. F7 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 .....5.90
Harvey,Ill. B5 .....5.40
LosAngeles R2, S30 ....6.85
Mansfield,Mass. B5 ....5.95
Massillon,O. R2, R8 ....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.85
NewCastle,Pa.(17) B4 ..5.40
Pittsburgh J5 .....5.40
Plymouth,Mich. P5 .....5.65
Putnam,Conn. W18 .....5.95
Readville,Mass. C14 ....5.95
St.Louis,Mo. M5 .....5.70
So.Chicago,Ill. W14 ....5.40
SpringCity,Pa. K3 .....5.85
Struthers,O. Y1 .....5.40
Waukegan,Ill. A7 .....5.40
Worcester,Mass. W19 ...5.85
Youngstown F3, Y1 ....5.40

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19.4.65

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 .....6.625
BeaverFalls,Pa. M12,R2 6.625
Bethlehem,Pa. B2 .....6.625
Buffalo B5 .....6.625
Camden,N.J. P13 .....6.80
Canton,O. T7 .....6.625
Carnegie,Pa. C12 .....6.625
Chicago W18 .....6.625
Cleveland A7, C20 .....6.625
Detroit R7 .....6.625
Detroit B5, P17 .....6.825
Donora,Pa. A7 .....6.625
Elyria,O. W8 .....6.625
Gary,Ind. R2 .....6.625
GreenBay,Wis. F7 .....6.625
Hammond,Ind. L2, M13 6.625
Hartford,Conn. R2 .....6.925
Harvey,Ill. B5 .....6.625
Lackawanna,N.Y. B2 ..6.625
LosAngeles S30 .....8.30
Mansfield,Mass. B5 ....6.925
Massillon,O. R2, R8 ....6.625
Midland,Pa. C18 .....6.625
Monaca,Pa. S17 .....6.625
Newark,N.J. W18 .....6.80
Plymouth,Mich. P5 .....6.825
So.Chicago W14 .....6.625
SpringCity,Pa. K3 .....6.80
Struthers,O. Y1 .....6.625
Warren,O. C17 .....6.625
Waukegan,Ill. A7 .....6.625
Worcester,Mass. A7 ....6.925
Youngstown F3, Y1 ....6.625

BARS, Reinforcing (To fabricators)

Ala.City,Ala. R2 .....4.30
Atlanta A11 .....4.50
Birmingham C15 .....4.30
Buffalo R2 .....4.30
Cleveland R2 .....4.30
Emeryville,Calif. J7 ....5.05
Fairfield,Ala. T2 .....4.30
Fairless,Pa. U5 .....4.45
Fontana,Calif. K1 .....5.00
Ft.Worth,Tex.(42) T4 ..4.90
Gary,Ind. U5 .....4.30
Houston S5 .....4.70

Ind.Harbor, Ind. I-2, Y1 4.30
Johnstown,Pa. B2 ....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.00
Milton,Pa. M18 .....4.30
Minnequa,Colo. C10 ....4.75
Niles,Calif. P1 .....4.85
Pittsburg,Calif. C11 ...5.00
Pittsburgh J5 .....4.30
Portland,Oreg. O4 .....5.05
SandSprings,Okla. S5 ..5.15
Seattle B3, N14 P23 ..5.05
So.Chicago R2 .....4.30
So.Duquesne,Pa. U5 ....4.30
So.SanFrancisco B3 ....5.05
SparrowsPoint,Md. B2 ..4.30
Sterling,Ill.(1) N15 ....4.30
Sterling,Ill. N15 .....4.40
Struthers,O. Y1 .....4.30
Torrance,Calif. C11 ....5.00
Youngstown R2, U5 ....4.30

BARS, Reinforcing
(Fabricated; to Consumers)

Johnstown,Pa., ¼-1" B2 5.70
KansasCity S5 .....6.50
LosAngeles B3 .....5.95
Marion,O. P11 .....5.55
Pittsburgh U8 .....5.72
Seattle B3, N14, P23 ..6.15
So.SanFrancisco B3 ...6.00
SparrowsPt. ¼-1" B2...5.70
Williamsport,Pa. S19 ..5.60

RAIL STEEL BARS

Avis,Pa.(3) J8 .....4.25
ChicagoHts.(3) C2, I-2..4.20
ChicagoHts.(4) C2, I-2..4.30
Ft.Worth,Tex.(26) T4 ..4.75
Franklin,Pa. (3) F5 ..4.20
Franklin,Pa. (4) F5 ..4.30
Marion,O.(3) P11 .....4.15
Moline,Ill.(3) R2 .....4.30
Tonawanda(3) B12 ....4.15
Tonawanda(4) B12 ....4.30
Williamsport,Pa.(3) S19 4.30

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 10.85
Economy,Pa.(D.R.) B14 13.50
Economy(Staybolt) B14 13.80
McK.Rks(S.R.) L5 ...10.85
McK.Rks.(D.R.) L5 ..14.75
McK.Rks.(Staybolt) L5 16.25

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala. R2 .....4.05
Allenport,Pa. P7 .....4.05
Ashland,Ky.(8) A10 ...4.05
Cleveland J5, R2 .....4.05
Conshohocken,Pa. A3 ...4.10
Detroit(8) M1 .....4.20
Ecorse,Mich. G5 .....4.20
Fairfield,Ala. T2 .....4.05
Fairless,Pa. U5 .....4.10
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.05
Geneva,Utah C11 .....4.15
GraniteCity,Ill. G4 ....4.25
Houston S5 .....4.45
Ind.Harbor,Ind. I-2, Y1.4.05
Irvin,Pa. U5 .....4.05
Kokomo,Ind. C16 .....4.15
Lackawanna,N.Y. B2 ..4.05
Mansfield,O. E6 (37) ...4.05
Mansfield,O. E6(38) ...4.80
Munhall,Pa. U5 .....4.05
Newport,Ky. N9 .....4.05
Niles,O. N12 .....4.05
Pittsburgh,Calif. C11 ....4.75
Pittsburgh J5 .....4.05
Portsmouth,O. P12 .....4.05
Riverdale,Ill. A1 .....4.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
SparrowsPoint,Md. B2 ..4.05
Steubenville,O. W10 ....4.05
Warren,O. R2 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5, Y1 ....4.05

SHEETS, H.R. (19 ga. lighter)

Ala.City,Ala. R2 .....5.35
Kokomo,Ind. C16 .....5.20
Niles,O. N12 .....4.95

SHEETS, H.R. (14 ga. heavier)
High-Strength Low-Alloy

Cleveland J5, R2 .....6.10
Conshohocken,Pa. A3 ...6.15
Ecorse,Mich. G5 .....6.25
Fairfield,Ala. T2 .....6.10
Fairless,Pa. U5 .....6.15
Fontana,Calif. K1 ....6.875
Gary,Ind. U5 .....6.10
Ind.Harbor,Ind. I-2, Y1.6.10
Irvin,Pa. U5 .....6.10
Lackawanna(35) B2 ....6.10
Munhall,Pa. U5 .....6.10
Pittsburgh J5 .....6.10
Sharon,Pa. S3 .....6.10
So.Chicago,Ill. U5 ....6.10
SparrowsPoint(36) B2 ..6.10
Warren,O. R2 .....6.10
Weirton,W.Va. W6 ....6.10
Youngstown U5, Y1 ....6.10

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 ....4.30
Cleveland R2 .....4.65
Ind.Harbor,Ind. I-2 ....4.30
Warren,O. R2 .....4.65

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 .....4.95
Cleveland J5, R2 .....4.95
Conshohocken,Pa. A3....5.00
Ecorse,Mich. G5 .....5.10
Fairfield,Ala. T2 .....4.95
Fairless,Pa. U5 .....5.00
Follansbee,W.Va. F4 ...4.95
Fontana,Calif. K1 .....6.05
Gary,Ind. U5 .....4.95
GraniteCity,Ill. G4 ....5.15
Ind.Harbor,Ind. I-2, Y1.4.95
Irvin,Pa. U5 .....4.95
Lackawanna,N.Y. B2 ..4.95
Middletown,O. A10 ....4.95
Pittsburg,Calif. C11 ....5.90
Pittsburgh J5 .....4.95
Portsmouth,O. P12 .....4.95
SparrowsPoint,Md. B2..4.95
Steubenville,O. W10 ....4.95
Warren,O. R2 .....4.95
Weirton,W.Va. W6 ....4.95
Youngstown Y1 .....4.95

SHEETS, Cold-Rolled
High-Strength Low-Alloy

Cleveland J5, R2 .....7.50
Ecorse,Mich. G5 .....7.65
Fairless,Pa. U5 .....7.55
Fontana,Calif. K1 .....8.55
Gary,Ind. U5 .....7.50
IndianaHarbor,Ind. Y1 ..7.50
Irvin,Pa. U5 .....7.50
Lackawanna(37) B2 ....7.50
Pittsburgh J5 .....7.50
SparrowsPoint(38) B2 ..7.50
Warren,O. R2 .....7.50
Weirton,W.Va. W6 ....7.50
Youngstown Y1 .....7.50

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....5.55
Middletown,O. A10 ....5.45
Warren,O. R2 .....5.55

SHEETS, Culvert

	Cu (16 Ga.)	Cu Alloy	Cu Fe
Ashland,Ky.	A10	6.50	....
Canton,O.	R2	5.70	6.15
Fairfield	T2	5.70	....
Gary,Ind.	U5	5.70	5.95
Ind.Harbor	I-2	6.25	6.50
Irvin,Pa.	U5	5.70	....
Kokomo,Ind.	C16	6.35	....
MartinsFry.,O.	W10	6.25	....
Newport,Ky.	N9	6.25	6.50
Pitts.,Calif.	C11	6.45	....
SparrowsPt.	B2	5.70	....

SHEETS, Culvert Pure Iron

Ashland,Ky. A10 .....6.75
Gary,Ind. U5 .....5.95
MartinsFerry,O. W10 ..6.50

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 .....5.45‡
Ashland,Ky. A10 .....5.45*
Butler,Pa. A10 .....5.45‡
Canton,O. R2 .....5.45‡
Dover,O. R1 .....5.45‡
Fairfield,Ala. T2 ....5.45*
Gary,Ind. U5 .....5.45*
GraniteCity,Ill. G4 ....5.65‡
Ind.Harbor,Ind. I-2 ...5.45‡
Irvin,Pa. U5 .....5.45‡
Kokomo,Ind. C16 ....5.55‡
MartinsFerry,O. W10 ..5.45*
Middletown,O. A10 ....5.45‡
Newport,Ky. N9 .....5.45‡
Niles,O. N12 .....5.45‡
Pittsburg,Calif. C11 ...6.20‡
SparrowsPt., Md. B2 ..5.45‡
Steubenville,O. W10 ...5.45‡
Weirton,W.Va. W6 ....5.45*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Galvanized
High-Strength Low-Alloy

Irvin,Pa. U5 .....8.20
SparrowsPoint(39) B2 ..8.20

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.85
Irvin,Pa. U5 .....5.85
Kokomo,Ind. C16 ....5.95†
Newport,Ky. N9 .....6.00
Niles,O. N12 .....6.00

SHEETS, Galvanized Ingot Iron

Ashland,Ky.(8) A10 ....5.70
Canton,O. R2 .....6.20

SHEETS, Galvanized
Ingot Iron
(Hot-dipped Continuous)

Ashland,Ky. A10 .....5.70
Butler,Pa. A10 .....5.70
Middletown,O. A10 ....5.70

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.30
Niles,O.(28) R2 .....6.30
Weirton,W.Va. W6 .....6.15

SHEETS, Aluminum Coated

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ...5.375
Cleveland R2 .....5.375
Gary,Ind. U5 .....5.375
GraniteCity,Ill. G4 ....5.575
Ind.Harbor,Ind. I-2 ...5.375
Irvin,Pa. U5 .....5.375
Middletown,O. A10 ....5.375
Niles,O. N12 .....5.375
Youngstown Y1 .....5.375

BLUED STOCK, 29 ga.

Follansbee,W.Va. F4 ..7.375
Follansbee(23) F4 .....6.60
Yorkville,O. W10 .....7.375

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 5.85
Gary,Ind. U5 .....5.85
Mansfield,O. E6 .....5.85
Middletown,O. A10 ....5.85
Niles,O. N12 .....5.85
Weirton,W.Va. W6 ....5.85

SHEETS, Long Terne, Ingot Iron

Middletown,O., A10 ....6.25

SHEETS, Well Casing

Fontana,Calif. K1 ....6.325

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div. Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C31 Chester Blast Furnace Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft.Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Josiyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng. HighCarb.Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nrthwst.Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P23 Pacific Steel Rolling

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless WeldedProducts
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.

T2 Tenn. Coal & Iron Div.
T3 Tenn.Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan.San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2....4.05
Allenport,Pa. P7 .....4.05
Alton,Ill. L1 .....4.225
Ashland,Ky.(8) A10 ....4.05
Atlanta A11 .....4.25
Bessemer,Ala. T2 .....4.05
Birmingham C15 .....4.05
Bridgeport,Conn.(10)S15 4.05
Buffalo(27) R2 .....4.05
Conshohocken,Pa. A3 ..4.10
Detroit M1 .....4.20
Ecorse,Mich. G5 .....4.20
Fairfield,Ala. T2 .....4.05
Fontana,Calif. K1 ....4.825
Gary,Ind. U5 .....4.05
Houston,Tex. S5 .....4.45
Ind.Harbor,Ind. I-2, Y1.4.05
Johnstown,Pa.(25) B2 ..4.05
KansasCity,Mo.(9) S5 ..4.65
Lackaw'na,N.Y.(25) B2.4.05
LosAngeles(25) B3 ....4.80
Milton,Pa. M18 .....4.05
Minnequa,Colo. C10 ...5.15
NewBritain(10) S15 ....4.05
N.Tonawanda,N.Y. B11.4.05
Pittsburg,Calif. C11 ....4.80
Portsmouth,O. P12 ....4.05
Riverdale,Ill. A1 .....4.05
SanFrancisco S7 .....5.00
Seattle(25) B3, P23 ....5.05
Seattle N14 .....5.05
Sharon,Pa. S3 .....4.05
So.Chicago,Ill. W14 ....4.05
So.SanFrancisco(25) B3.4.80
SparrowsPoint,Md. B2 ..4.05
Sterling(1) N15 .....4.05
Sterling,Ill. N15 .....4.15
Torrance,Calif. C11 ....4.80
Warren,O. R2 .....4.05
Weirton,W.Va. W6 ....4.05
Youngstown U5 .....4.05

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.70
Fontana,Calif. K1 ....8.10
Gary,Ind. U5 .....6.70
Houston,Tex. S5 .....7.10
KansasCity,Mo. S5 ....7.30
LosAngeles B3 .....7.90
NewBritn.,Conn.(10)S15 6.45
Newport,Ky. N9 .....6.70
Seattle P23 .....7.80
Sharon,Pa. S3 .....6.70
So.Chicago W14 .....6.70
Youngstown U5 .....6.70

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 .....6.15
Conshohocken,Pa. A3 ..6.15
Ecorse,Mich. G5 .....6.30
Fairfield,Ala. T2 .....6.15
Fontana,Calif. K1 .....7.25
Gary,Ind. U5 .....6.15
Houston S5 .....6.55
Ind.Harbor,Ind. I-2, Y1.6.15
KansasCity,Mo. S5 ....6.75
Lackawanna,N.Y. B2 ..6.15
LosAngeles(25) B3 ....6.90
Seattle(25) B3, P23 ....7.15
Sharon,Pa. S3 .....6.15
So.SanFrancisco(25) B3.6.90
SparrowsPoint,Md. B2 ..6.15
Warren,O. R2 .....6.15
Weirton,W.Va. W6 ....6.15
Youngstown U5, Y1 ....6.15

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ....4.30
Warren,O. R2 .....4.65

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....5.75
Baltimore T6 .....5.75
Bridgeport,Conn.(10)S15 5.75
Cleveland A7, J5 .....5.75
Conshohocken,Pa. A3 ..5.80
Dearborn,Mich. D3 ....5.90
Detroit D2, M1, P20 ..5.90
Dover,O. G6 .....5.75
Ecorse,Mich. G5 .....5.90
Follansbee,W.Va. F4 ...5.75
Fontana,Calif. K1 .....7.65
FranklinPark,Ill. T6 ....5.85
Ind.Harbor,Ind. I-2 ....5.85
Indianapolis C8 .....5.90
Lackawanna,N.Y. B2 ..5.75
LosAngeles C1 .....7.80
Mattapan,Mass. T6 ....6.30
Middletown,O. A10 ....5.75
NewBedford,Mass. R10..6.20
NewBritain(10) S15 ....5.75
NewCastle,Pa. B4, E5 ..5.75
NewHaven,Conn. A7 ....6.50
NewHaven,Conn. D2 ....6.20
Pawtucket,R.I. R3 ....6.40
Pawtucket,R.I. N8 ....6.30
Pittsburgh J5 .....5.75
Portsmouth,O. P12 ....5.75
Riverdale,Ill. A1 .....5.85
Rome,N.Y.(32) R6 ....5.75
Sharon,Pa. S3 .....5.75
Sharon,Pa. S3 .....5.75
Trenton,N.J.(31) R5 ...7.30
Wallingford,Conn. W2 ..6.20
Warren,O. B9, R2, T5..5.75
Weirton,W.Va. W6 ....5.75
Worcester,Mass. A7 ....6.60
Youngstown C8, Y1 ....5.75

STRIP, Cold-Rolled Alloy

Carnegie,Pa. S18 .....12.45
Cleveland A7 .....12.45
Dover,O. G6 .....12.45
Fontana,Calif. K1 ....14.55
FranklinPark,Ill. T6 ...12.45
Harrison,N.J. C18 .....12.45
Mattapan,Mass. T6 ....12.80
Pawtucket,R.I. N8 ....12.80
Sharon,Pa. S3 .....12.45
Worcester,Mass. A7 ...12.75
Youngstown C8 .....12.90

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7, J5 .....8.60
Dearborn,Mich. D3 ....8.75

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	5.75	8.35	9.30	11.45	14.15
Bridgeport,Conn.(10) S15	5.75	8.05	9.00	11.15	13.85
Bristol,Conn. W1	...	...	9.30	11.45	....
Carnegie,Pa. S18	...	8.05	9.00	11.15	13.85
Cleveland A7	5.75	8.05	9.00	11.15	13.85
Cleveland C7	...	8.05	9.00	11.15	13.85
Dearborn,Mich. D3	5.90	8.25	9.20	....	....
Detroit D2	5.90	8.25	9.20	10.95	....
Dover,O. G6	5.85	8.05	9.00	11.15	13.85
FranklinPark,Ill. T6	5.85	8.05	9.00	11.15	13.85
Harrison,N.J. C18	...	...	9.30	11.45	14.15
Indianapolis C8	6.00	8.20	9.00	11.15	13.85
Mattapan,Mass. T6	6.30	8.35	9.30	11.45	14.15
NewBritn.,Conn.(10) S15.	5.75	8.05	9.00	11.15	13.85
NewCastle,Pa. B4	5.75	8.05	9.00	11.15	....
NewCastle,Pa. E5	5.75	8.05	9.00	11.15	13.85
NewHaven,Conn. D2	6.20	8.35	9.30	11.25	....
NewYork W3	...	8.35	9.30	11.45	14.15
Pawtucket,R.I. N8	6.30	8.35	9.30	11.45	14.15
Riverdale,Ill.(1) A1	5.85	8.05	9.00	11.15	13.85
Rome,N.Y.(32) R6	5.75	8.05	9.00	10.95	13.25
Sharon,Pa. S3	5.75	8.05	9.00	11.15	13.85
Trenton,N.J. R5	...	8.35	9.30	11.45	14.15
Wallingford,Conn. W2	6.20	8.35	9.30	11.45	14.15
Warren,O. T5	5.75	8.05	9.00	11.15	13.85
Weirton,W.Va. W6	5.75	8.05	9.00	11.15	13.85
Worcester,Mass. A7, T6..	6.60	8.35	9.30	11.45	14.15
Youngstown C8	5.85	8.05	9.00	11.15	13.85
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	12.90	15.60	....
Buffalo W12	...	...	12.90	....	....
Harrison,N.J. C18	...	...	12.90	15.60	19.00
NewYork W3	...	...	12.90	15.60	19.00
Trenton,N.J. R5	...	...	12.90	15.60	19.00
Worcester,Mass. T6	...	...	12.90	15.60	19.00
Worcester,Mass. W12	...	...	12.90	....	....
Youngstown C8	...	...	13.25	15.95	19.35

SILICON STEEL

H.R. SHEETS (22 Ga., cut lengths)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom,W.Va. W10	....	...	9.10	10.10	11.00
Brackenridge,Pa. A4	....	...	9.10	10.10	11.00
Mansfield,O. E6	8.025	8.50	9.10	10.10	11.00
Newport,Ky. N9	8.025	8.50	9.10	10.10	11.00
Niles,O. N12	8.025	8.50	9.10	10.10	....
Vandergrift,Pa. U5	....	8.50	9.10	10.10	11.00
Warren,O. R2	8.025	8.50	9.10	10.10	11.00
Zanesville,O. A10	....	8.50	9.10	10.10	11.00

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
Brackenridge,Pa. A4	....	....	9.85	10.85	11.75
GraniteCity,Ill. G4	8.425*	8.95*	9.55*	10.55*	....
IndianaHarbor,Ind. I-2	8.225	8.75*	9.35*	....	....
Vandergrift,Pa. U5	....	9.25†	9.85†	10.85†	11.75†
Vandergrift,Pa. U5	8.225*	8.75*	9.35*	10.35*	11.25*
Warren,O. R2	8.225†	9.25	9.85	10.85	11.75
Zanesville,O. A10	....	9.25	9.85	10.85	11.75

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	11.95	12.50	13.00	14.00
Brackenridge,Pa. A4	11.95	....	....	....
Newport,Ky. N9	11.95	....	....	....
Vandergrift,Pa. U5	11.95	12.50	13.00	14.00
Zanesville,O. A10	11.95‡	12.50‡	13.00‡	14.00‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-72
Brackenridge,Pa. A4	....	15.00	16.60	17.10	....
Butler,Pa. A10	....	....	16.60	17.10	....
Vandergrift,Pa. U5	14.00	15.00	16.60	17.10	12.70
Warren,O. R2	....	....	....	....	12.70‡

* Semiprocessed. † Fully processed only. ‡ Coils annealed; semiprocessed ½c lower. § Coils, ¾-cent higher.

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3 .....6.15
Warren,O. B9 .....6.15

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.775
Riverdale,Ill. A1 .....4.625
Sharon,Pa. S3 .....4.475
Youngstown U5 .....4.475

STRIP, Electrogalvanized

Dover,O. G6 .....5.75*
Riverdale,Ill. A1 .....5.85*
Youngstown C8 .....5.75*
Warren,O. B9 .....5.75*

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....6.35

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.50	$7.75	$8.15
Fairfield,Ala. T2	7.60	7.85	8.25
Fairless,Pa. U5	7.60	7.85	8.25
Gary,Ind. U5	7.50	7.75	8.15
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.50	7.75	8.15
Irvin,Pa. U5	7.50	7.75	8.15
Niles,O. R2	7.50	7.75	8.15
Pittsburg,Calif. C11	8.25	8.50	8.90
SparrowsPoint,Md. B2	7.60	7.85	8.25
Weirton,W.Va. W6	7.50	7.75	8.15
Yorkville,O. W10	7.50	7.75	8.15

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.175	....	....
Niles,O. R2	6.175	6.375	6.575

TIN PLATE,American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.80	$9.05
Fairfield,Ala. T2	8.90	9.15
Fairless,Pa. U5	8.90	9.15
Gary,Ind. U5	8.80	9.06
Ind.Har. I-2, Y1.	8.80	9.05
Irvin,Pa. U5	8.80	9.05
Pitts.,Cal. C11	9.55	9.80
Sp.Pt.,Md. B2	8.90	9.15
Warren,O. R2	8.80	9.05
Weirton,W.Va. W6	8.80	9.05
Yorkville,O. W10	8.80	9.05

BLACK PLATE (Base Box)

Aliquippa,Pa. J5 .....$6.60
Fairfield,Ala. T2 .....6.70
Fairless,Pa. U5 .....6.70
Gary,Ind. U5 .....6.60
GraniteCity,Ill. G4 ....6.70
Ind.Harbor,Ind. I-2, Y1.6.60
Irvin,Pa. U5 .....6.60
Niles,O. R2 .....6.60
Pittsburg,Calif. C11 ....7.35
SparrowsPoint,Md. B2...6.70
Warren,O. R2 .....6.60
Weirton,W.Va. W6 ....6.60
Yorkville,O. W10 .....6.60

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4 ...6.20
Gary,Ind. U5 .....6.20
GraniteCity,Ill. G4 ....6.30
Ind.Harbor,Ind. Y1 ....6.20
Irvin,Pa. U5 .....6.20
Yorkville,O. W10 .....6.20

MANUFACTURING TERNES (Special Coated; Base Box)

Gary,Ind. U5 .....$7.85
Irvin,Pa. U5 .....7.85
Yorkville,O. W10 .....7.85

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10 .....$8.75

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5 .....9.85

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..5.75
Aliquippa,Pa. J5 .....5.75
Alton,Ill. L1 .....5.925
Atlanta A11 .....5.95
Bartonville,Ill. K4 ....5.85
Buffalo W12 .....5.75
Chicago W13 .....5.75
Cleveland A7, C20 ....5.75
Crawfordsville,Ind. M8..5.85
Donora,Pa. A7 .....5.75
Duluth,Minn. A7 .....5.75
Fairfield,Ala. T2 .....5.75
Fostoria,O.(24) S1 ....5.95
Houston S5 .....6.15
Jacksonville,Fla. M8 ....6.27
Johnstown,Pa. B2 .....5.75
Joliet,Ill. A7 .....5.75
KansasCity,Mo. S5 ....6.35
Kokomo,Ind. C16 .....5.85
LosAngeles B3 .....6.70
Minnequa,Colo. C10 ....6.00
Monessen,Pa. P7 .....5.75
Newark 6-8 ga. I-1 ....6.40
No.Tonawanda B11 ....5.75
Palmer,Mass. W12 ....6.05
Pittsburg,Calif. C11 ....6.70
Portsmouth,O. P12 .....5.75
Rankin,Pa. A7 .....5.75
So.Chicago,Ill. R2 .....5.75
So.SanFrancisco C10 ...6.70
SparrowsPoint,Md. B2 ..5.85
Sterling,Ill.(1) N15 ....5.75
Sterling,Ill. N15 .....5.85
Struthers,O. Y1 .....5.75
Waukegan,Ill. A7 .....5.75
Worcester,Mass. A7 ....6.05

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....7.20
Alton,Ill. L1 .....7.375
Bartonville,Ill. K4 .....7.30
Buffalo W12 .....7.20
Cleveland A7 .....7.20
Donora,Pa. A7 .....7.20
Duluth,Minn. A7 .....7.20
Fostoria,O. S1 .....7.20
Johnstown,Pa. B2 .....7.20
LosAngeles B3 .....8.15
Millbury,Mass.(12) N6 ..7.50
Minnequa,Colo. C10 ....7.45
Monessen,Pa. P7, P16..7.20
Muncie,Ind. I-7 .....7.40
Palmer,Mass. W12 .....7.50
Pittsburg,Calif. C11 ....8.15
Portsmouth,O. P12 .....7.20
Roebling,N.J. R5 .....7.50
So.Chicago,Ill. R2 .....7.20
So.SanFrancisco C10 ..8.15
SparrowsPt.,Md. B2 ....7.30
Struthers,O. Y1 .....7.20
Trenton,N.J. A7 .....7.50
Waukegan,Ill. A7 .....7.20
Worcester A7,J4,T6,W12 7.50

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....6.90
Alton,Ill. L1 .....7.075
Buffalo W12 .....6.90
Cleveland A7 .....6.90
Donora,Pa. A7 .....6.90
Duluth,Minn. A7 .....6.90
Johnstown,Pa. B2 .....6.90
KansasCity,Mo. S5 ....7.50
LosAngeles B3 .....7.85
Minnequa,Colo. C10 ..7.075
Monessen,Pa. P7, P16 ..6.90
NewHaven,Conn. A7 ...7.20
Palmer,Mass. W12 .....7.20
Pittsburg,Calif. C11 ....7.85
Portsmouth,O. P12 .....6.90
Roebling,N.J. R5 .....7.20
So.Chicago,Ill. R2 .....6.90
So.SanFrancisco C10....7.85
SparrowsPoint,Md. B2 ..7.00
Trenton,N.J. A7 .....7.20
Waukegan,Ill. A7 .....6.90
Worcester,Mass. A7 ....7.20

WIRE, Fine & Weaving(8" Coils)

Alton Ill. L1 .....11.375
Bartonville,Ill. K4 .....11.30
Buffalo W12 .....11.20
Chicago W13 .....11.20
Cleveland A7 .....11.20
Crawfordsville,Ind. M8.11.30
Fostoria,O. S1 .....11.20
Jacksonville,Fla. M8 ..11.73
Johnstown,Pa. B2 .....11.20
Kokomo,Ind. C16 .....11.20
Minnequa,Colo. C10 ...10.95
Monessen,Pa. P16 .....11.20
Muncie,Ind. I-7 .....11.40
Palmer,Mass. W12 .....11.50
Roebling,N.J. R5 .....11.50
So.SanFrancisco C10 ..11.55
Waukegan,Ill. A7 .....11.20
Worcester,Mass. A7,T6.11.50

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 .....9.90
Buffalo W12 .....9.90
Johnstown,Pa. B2 .....9.90
Minnequa,Colo. C10 ..10.025
Monessen,Pa. P16 .....9.90
Muncie,Ind. I-7 .....10.10
Portsmouth,O. P12 .....9.90
Roebling,N.J. R5 .....10.20
SparrowsPt.,Md. B2 ...10.00

ROPE WIRE (A)

Alton,Ill. L1 .....9.75
Bartonville,Ill. K4 .....9.35
Buffalo W12 .....9.75
Fostoria,O. S1 .....9.75
Johnstown,Pa. B2 .....9.75
Monessen,Pa. P7 .....9.35
Monessen,Pa. P16 .....9.75
Muncie,Ind. I-7 .....9.95
Palmer,Mass. W12 ....10.05
Portsmouth,O. P12 ....9.35
Roebling,N.J. R5 .....10.05
SparrowsPt. B2 .....9.85
Struthers,O. Y1 .....9.75
Worcester J4, T6 .....9.65

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE

(Continued)

WIRE, Tire Bead

Alton,Ill. L1	13.25
Bartonville,Ill. K4	13.25
Monessen,Pa. P16	13.15
Portsmouth,O. P12	13.15
Roebling,N.J. R5	13.45

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.95
Baltimore T6	8.25
Buffalo W12	7.95
Cleveland A7	7.95
Crawfordsville,Ind. M8	8.05
Dover,O. G6	7.95
Fostoria,O. S1	7.95
Kokomo,Ind. C16	8.05
FranklinPark,Ill. T6	8.05
Massillon,O. R8	7.95
Milwaukee C23	8.15
Monessen,Pa. P7, P16	7.95
Pawtucket,R.I. N8	8.25
Rome,N.Y.(32) R6	7.95
Trenton,N.J. R5	8.25
Worcester A7, T6, W12	8.25

WIRE, Merchant Quality (6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	6.90 7.30**
Aliquippa J5	6.90 7.425§
Atlanta A11	7.00 7.55
Bartonville(48) K4	7.00 7.55
Buffalo W12	6.90 7.30†
Cleveland A7	6.90 ....
Crawfordsville M8	7.00 7.55
Donora,Pa. A7	6.90 7.30†
Duluth,Minn. A7	6.90 7.30†
Fairfield T2	6.90 7.30†
Houston,Tex. S5	7.30 7.70†
Jacks'ville,Fla. M8	7.425 7.95
JohnstownB2(48)	6.90 7.45*
Joliet,Ill. A7	6.90 7.30†
KansasCity,Mo. S5	7.50 7.90†
Kokomo C16	7.00 7.40†
LosAngeles B3	7.85 ....
Minnequa C10	7.15 7.55**
Monessen P7 (48)	6.90 7.45
Palmer W12	7.20 7.60†
Pitts.,Calif. C11	7.85 8.25†
Portsmouth,O. P12	6.90 ....
Rankin A7	6.90 7.30†
So.Chicago R2	6.90 7.30**
S.S.Fran. C10	7.85 8.25**
SparwsPt.B2(48)	7.00 7.55*
Sterling(1)(48)N15	6.90 7.45
Struthers,O.(48)Y1	6.90 7.40‡
Worcester A7	7.20 ....

* Based on 11c zinc; † 5c zinc; ‡ Less than 10c zinc; **Subject to zinc equalization extras.

WOVEN FENCE, 9-15½ Ga.

	Col.
Ala.City,Ala. R2	146**
Ala.City, 17 ga. R2	241**
Ala.City, 18 ga. R2	251**
Aliq'ppa,Pa.9-14½ga.J5	149§
Atlanta A11	151
Bartonville,Ill. K4	151
Crawfordsville,Ind. M8	151
Donora,Pa. A7	146†
Duluth,Minn. A7	146†
Fairfield,Ala. T2	146†
Houston,Tex. S5	154†
Johnstown,Pa.(43) B2	149
Joliet,Ill. A7	146†
KansasCity,Mo. S5	158†
Kokomo,Ind. C16	148†
Minnequa,Colo. C10	154**
Monessen,Pa. 9 ga. P17	151
Pittsburg,Calif. C11	169†
Rankin,Pa. A7	146†
So.Chicago,Ill. R2	146**
Sterling,Ill.(1) N15	149

† Based on 5c zinc; * 11c zinc; § 10c zinc; ** Subject to zinc equalization extras.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	155
Atlanta A11	157
Bartonville,Ill. K4	157
Crawfordsville,Ind. M8	157
Donora,Pa. A7	155
Duluth,Minn. A7	155
Fairfield,Ala. T2	155
Joliet,Ill. A7	155
Houston S5	163
KansasCity,Mo. S5	167
Kokomo,Ind. C16	157
Minnequa,Colo. C10	160
Pittsburg,Calif. C11	179
So.Chicago,Ill. R2	155
So.SanFran.,Calif. C10	179
SparrowsPoint,Md. B2	157
Sterling,Ill.(1) N15	155

WIRE, Barbed

	Col.
Alabama,City,Ala. R2	159**
Aliquippa J5	156§
Atlanta A11	164
Bartonville,Ill. K4	164
Crawfordsville,Ind. M8	164
Donora,Pa. A7	159†
Duluth,Minn. A7	159†
Fairfield,Ala. T2	159†
Houston,Tex. S5	167†
Johnstown,Pa. B2	162*
Joliet,Ill. A7	159†
KansasCity,Mo. S5	171†
Kokomo,Ind. C16	161†
Minnequa,Colo. C10	165**
Monessen,Pa. P7	163
Pittsburg,Calif. C11	179†
Rankin,Pa. A7	159†
So.Chicago,Ill. R2	159**
S.SanFrancisco C10	179**
SparrowsPoint,Md. B2	164*
Sterling,Ill.(1) N15	162

† Based on 5c zinc; * 11c zinc; § 10c zinc; **Subject to zinc equalization extras.

WIRE (16 gage)	An'ld Galv. Stone	Galv. Stone
Ala.City R2	13.15	14.70**
Bartonville K4	13.25	15.10
Buffalo W12	13.15	....
Cleveland A7	13.15	....
Crawfrdsville M8	13.25	15.10
Fostoria,O. S1	13.25	14.80†
Johnstown B2	13.15	15.00*
Kokomo C16	13.25	15.10*
Minnequa C10	13.40	15.10**
Palmer,Mas.W12	13.15	14.70*
Pitts.,Calif. C11	13.50	15.05†
So.Chicago R2	13.15	14.70
SparrowsPt. B2	13.25	15.10*
Sterling(1) N15	13.15	15.00
Waukegan A7	13.15	14.70†
Worcester A7	13.45	....

* Based on 11c zinc; † 5c zinc; § 10c zinc; ** Subject to zinc equalization extras.

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2	137
Aliquippa,Pa. J5	137
Atlanta A11	139
Bartonville,Ill. K4	139
Chicago,Ill. W13	137
Cleveland A9	142
Crawfordsville,Ind. M8	139
Donora,Pa. A7	137
Duluth,Minn. A7	137
Fairfield,Ala. T2	137
Galveston,Tex. D7	139
Houston,Tex. S5	145
Johnstown,Pa. B2	137
Joliet,Ill. A7	137
KansasCity,Mo. S5	149
Kokomo,Ind. C16	139
Minnequa,Colo. C10	142
Monessen,Pa. P7	137
Pittsburg,Calif. C11	156
Rankin,Pa. A7	137
So.Chicago,Ill. R2	137
SparrowsPt.,Md. B2	139
Sterling,Ill.(1) N15	137
Worcester,Mass. A7	143

NAILS, CUT (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$8.30
Wheeling,W.Va. W10	8.30

STAPLES, Polished Stock

To dealers & mfrs. (7)	Col.
Aliquippa,Pa. J5	138
Atlanta A11	140
Bartonville,Ill. K4	140
Crawfordsville,Ind. M8	140
Donora,Pa. A7	138
Duluth,Minn. A7	138
Fairfield,Ala. T2	138
Johnstown,Pa. B2	138
Joliet,Ill. A7	138
Kokomo,Ind. C16	140
Minnequa,Colo. C10	143
Monessen,Pa. P7	138
Pittsburg,Calif. C11	157
Rankin,Pa. A7	138
SparrowsPt.,Md. B2	140
Sterling,Ill.(1) N15	138
Worcester,Mass. A7	144

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	150
Duluth,Minn. A7	150
Franklin,Pa. F5	150
Johnstown,Pa. B2	150
Marion,O. P11	150
Minnequa,Colo. C10	155
Moline,Ill. R2	155
So.Chicago,Ill. R2	150
Tonawanda,N.Y. B12	150
Williamsport,Pa. S19	150

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(Base discounts, per cent off list, f.o.b. midwestern plants)

4 in. and shorter:	
½-in. & smaller diam	2
Over 4 in. through 6 in.:	
½ in. & smaller diam	+3
6 in. and shorter:	
⅞-in. and ⅝-in.	+4
¾ in. and larger	+6
Longer than 6 in.:	
All diameters	+15
Lag bolts, all diams.:	
6 in. and shorter	6
Over 6 in. long	+2
Ribbed Necked Carriage	+4
Blank	10
Plow	23
Step, Elevator, Tap and Sleigh Shoes	10
Tire Bolts	+3
Boiler & Fitting-Up Bolts	21

NUTS

H.P. and C.P., regular & heavy:	
Square, all sizes	55
H.P., Hex, regular & heavy:	
⅜" and smaller	55
⅞" to 1¼", inclusive	58
1⅜" to 1½", inclusive	60
1⅝" and larger	55
C.P. Hex regular & heavy:	
All sizes	55
Hot Galv. Nuts (all types):	
⅝" or smaller	38
⅞" to 1½", inclusive	41
Finished Hex Nuts:	
New standard, all sizes	55
Semifinished & Slotted Hex:	
Regular and heavy, all sizes	55

SQUARE HEAD SET SCREWS

(1035 steel; packaged; per cent off list)

1 in. diam. x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	34
¼ in. diam. & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	41—10
Plated finishes	21—10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
¼-in. through ⅝-in.	38
⅝-in. through 1 in.	15
Longer than 6 in.:	
¼-in. through ⅝-in.	20
⅝-in. through 1 in.	7

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in. larger 9.25
⅞-in. under. List less 37%

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. in.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	19.59	19.00
1¼	13	....	23.21	18.77
1½	13	21.40	25.65	20.75
1¾	13	25.28	30.31	24.52
2	13	28.33	33.97	27.48
2¼	13	31.91	38.26	30.95
2½	12	34.63	41.52	33.59
2½	12	38.15	45.74	37.00
2¾	12	41.31	49.53	40.07
3	12	44.05	52.82	42.72

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. Toe Rails All No. 2	60 lb Under
Bessemer,Pa. U5	4.45	4.35	4.40	5.35
Ensley,Ala. T2	4.45	4.35	...	5.35
Fairfield,Ala. T2	...	...	...	5.35
Gary,Ind. U5	4.45	4.35	4.40	...
Huntington,W.Va. W7	...	...	...	5.35
IndianaHarbor,Ind. I-2	4.45	4.35	4.40	...
Johnstown,Pa. B2	...	...	...	(16)5.35
Lackawanna,N.Y. B2	4.45	4.35	...	5.35
Minnequa,Colo. C10	4.45	4.35	...	5.85
Steelton,Pa. B2	4.45	4.35	...	5.35
Williamsport,Pa. S19	...	...	...	5.35

TIE PLATES

Fairfield,Ala. T2	5.275
Gary,Ind. U5	5.275
Ind.Harbor,Ind. I-2	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Seattle B3	5.425
Steelton,Pa. B2	5.275
Torrance,Calif. C11	5.425

TRACK BOLTS (20) Treated

Cleveland R2	11.50
KansasCity,Mo. S5	11.50
Lebanon,Pa. B2	11.50
Minnequa,Colo. C10	11.50
Pittsburgh O3, P14	11.50
Seattle,Wash. B3	12.00

AXLES

Ind.Harbor,Ind. S13	6.75
Johnstown,Pa. B2	6.75

JOINT BARS

Bessemer,Pa. U5	5.425
Fairfield,Ala. T2	5.425
KansasCity,Mo. S5	5.425
Ind.Harbor,Ind. I-2	5.425
Joliet,Ill. U5	5.425
Lackawanna,N.Y. B2	5.425
Minnequa,Colo. C10	5.425
Steelton,Pa. B2	5.425

SCREW SPIKES

Cleveland R2	11.00

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.30
Ind.Harbor,Ind. I-2, Y1	7.30
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.30
Minnequa,Colo. C10	7.30
Pittsburgh J5	7.30
Seattle B3	7.80
So.Chicago,Ill. R2	7.30
Struthers,O. Y1	7.30
Youngstown R2	7.30

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron: 98+% Fe, annealed	15.25
Unannealed:	
Minus 100 mesh	11.75
Minus 35 mesh	9.25
Minus 20 mesh	9.00
Swedish, c.l.f. N.Y., c.l., in bags	11.25
Domestic (Swedish), f.o.b. Riverton, N. J., in bags	9.50
Electrolytic iron:	
Melting stock, 99.91% Fe, irregular fragments of ⅛ in. x 1.3 in.	22.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	32.50
Unannealed (99+% Fe) (minus 325 mesh)	52.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron: 97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum: Atomized, 500 lb drums, frgt, allowed:	
Carlots	30.00
Ton lots	32.00
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	29.75-37.25†
Bronze, 5000-lb lots	48.75-52.00†
Copper:	
Electrolytic	13.75*
Reduced	13.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	61.00
Minus 100 mesh	67.00
Minus 200 mesh	72.00
Nickel, unannealed	89.50
Nickel-Silver, 5000-lb lots	45.50§
Nickel-Silver, 5000-lb lots	49.00**
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	43.50
Solder	7.00*
Stainless Steel, 302	91.00
Tin	14.50*
Zinc, 5000-lb lots	17.25-31.00‡
Tungsten	Dollars
Melting grade, 99% 50 to 200 mesh:	
1000 lb and over	4.95
Less than 1000 lb	5.10
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni; **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛" to 1 7/16"; 1 7/16" to 1 15/16" 4.78c; 1 15/16" to 7 5/16" 5.15c.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 4.95c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c for carbon and 0.35c H.S.-L.A.
(31) Widths over ⅝-in.; 6.40c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 gage & heavier; 60" & narrower.
(38) 14 gage & lighter.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. to mill zone or within switching limits, 5.10c.
(43) 9 1½ gage.
(48) 6 7 gage.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Ambridge, Pa. N2	13.5	...	17.5	...	20	...	21.5	...	21.5	...	20.75	...	23.25	...
Lorain, O. N3	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5
Youngstown Y1	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	13.5	+3	17.5	+0.25	20	2.25	21.5	3.75	21.5	3.75	20.75	3	23.25	5.5

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Alton, Ill. L1	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Benwood, W. Va. W10	24	+4.5	15.25	+10.25	7.25	+17.25	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Butler, Pa. F6	25	+3.5	17	+8.5	9.5	+15	....	..	....	....	....	..	....	....
Etna, Pa. N2	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Fairless, Pa. N3	...	...	....	....	....	....	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Fontana, Calif. K1	...	...	....	....	....	....	10.75	+6.5	13.75	+2.5	16.25	1	18.75	2.25
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	22.75	5.5	25.75	9.5	28.25	13	30.75	14.25
Lorain, O. N3	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sharon, Pa. S4	25	+3.5	17	+8.5	9.5	+15	....	..	....	....	....	..	....	....
Sharon, Pa. M6	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Sparrows Pt., Md. B2	23	+5.5	15	+10.5	7.5	+17	21.75	4.5	24.75	8.5	27.25	12	29.75	13.25
Youngstown R2, Y1	...	...	....	....	....	....	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25
Wheatland, Pa. W9	23	+5.5	15	+10.5	7.5	+17	23.75	6.5	26.75	10.5	29.25	14	31.75	15.25

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Alton, Ill. L1	30.25	14.25	30.75	14.75	32.25	15	32.25	15	....	....	....	....
Benwood, W. Va. W10	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Etna, Pa. N2	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Fairless, Pa. N3	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Fontana, Calif. K1	19.25	3.25	19.75	3.75	21.25	4	21.25	4	12.5	+5.25	12.5	+5.25
Ind. Harbor, Ind. Y1	31.25	15.25	31.75	15.75	33.25	16	33.25	16	24.5	6.75	25.5	6.75
Lorain, O. N3	32.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Sharon, Pa. M6	13.25	16.25	32.75	16.75	34.25	17	34.25	17	....	....	....	....
Sparrows Pt., Md. B2	30.25	14.25	30.75	14.75	32.25	15	32.25	15	23.5	5.75	23.5	5.75
Youngstown R2, Y1	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75
Wheatland, Pa. W9	32.25	16.25	32.75	16.75	34.25	17	34.25	17	25.5	7.75	25.5	7.75

*Galvanized pipe discounts based on current price of zinc (11.50c, East St. Louis).

Stainless Steel

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. & C.F. H.R. Strip	Bars; Wire	Plates	Sheets	C.R. Strip; Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	41.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	41.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	44.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	43.75	43.75
304L	....	....	36.00	41.00	39.25	42.25	44.75	48.75	48.75
305	19.50	25.50	....	36.25	37.00	37.25	40.00	46.50	46.50
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	48.00	48.00
309	26.50	34.75	42.75	49.25	49.25	50.50	53.75	62.00	62.00
309S	28.50	37.50	46.75	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	62.75	67.50	69.00	72.25	72.25
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.50	54.50	53.25	55.50	58.75	62.75	62.75
316L	....	....	51.50	59.50	58.25	60.50	63.75	67.75	67.75
317	33.00	43.50	57.25	66.75	67.50	68.25	70.75	77.00	77.00
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	80.25	80.25
321	22.75	29.50	35.25	40.75	41.00	42.00	45.75	50.50	50.50
347	34.50	45.75	53.75	61.50	62.00	63.25	68.25	76.50	76.50
18-8CbTa	28.25	37.25	45.00	51.25	52.00	52.75	57.50	65.50	65.60
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	39.75	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	34.25	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	52.75	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	34.75	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	18.75	24.50	28.25	27.50	29.25	30.50	35.25	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.50	38.25	50.25	39.50	40.75	59.75	59.75
501	....	....	14.00	14.50	21.25	16.00	18.25	29.00	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	30.00	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cleops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates, Carbon Base 10%	Plates, Carbon Base 20%	Sheets, Carbon Base 20%
Stainless:			
302	....	31.00	31.00
304	27.60–28.10	32.50–33.20	32.50
310	36.50	41.00	....
316	32.60–33.10	37.70–42.75	42.75
318	37.00–37.50	42.20–42.70	....
321	29.36–29.80	34.40–37.00	37.00
347	30.40–30.90	35.50–40.50	40.50
405	23.40–23.90	30.60–31.10	....
410	22.00–23.40	30.10–30.60	....
430	23.40	30.60	....
Inconel	*47.90*	*63.90*	....
Nickel	*39.50*	*54.10*	....
Monel	*40.80*	*54.80*	....
L-Nickel	*41.70*	*58.50*	....
Copper*	....	....	46.00

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	28.85	35.85	25.00	32.25

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.26	5% Cr Hot Work	0.405
Extra Carbon	0.31-.315	W-Cr Hot Work	0.425
Special Carbon	0.37	V-Cr Hot Work	0.445
Oil Hardening	0.405	Hi-Carbon-Cr	0.73

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.030
18.25	4.25	1	4.75	...	2.245-2.415
18	4	2	9	...	2.615
18	4	2	....	...	1.705
18	4	1	....	...	1.540
14	4	2	5	...	2.185
13.75	3.75	2	5	...	2.185
13.5	4	3	....	...	1.805
9	3.5	..	....	...	1.115
6	4	2	....	5	1.045
6	4	3	....	6	1.290
1.5	4	1	....	8.5	0.900

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	56.50†	....
Gadsden, Ala. R2	52.38	52.88	....	....
Woodward, Ala. W15	52.38	52.88	56.50†	....
Cincinnati, deld.	....	60.58	....	....
Buffalo District				
Buffalo R2	56.00	56.50	57.00	57.50
Buffalo H1	56.00	56.50	57.00	....
Tonawanda, N.Y. W12	56.00	56.50	57.00	....
No. Tonawanda, N.Y. T9	....	56.50	57.00	57.50
Boston, deld.	66.65	67.15	67.65	....
Rochester, N.Y., deld.	59.02	59.52	60.02	....
Syracuse, N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Chicago R2	56.00	....	56.50	....
Gary, Ind. U5	56.00	....	56.50	....
Indiana Harbor, Ind. I-2	56.00	....	56.50	....
So. Chicago, Ill. W14, Y1	56.00	56.50	56.50	....
So. Chicago, Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon, Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron, O., deld.	58.75	59.25	59.25	59.75
Lorain, O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem, Pa. B2	58.00	58.50	59.00	59.50
New York, deld.	....	62.28	62.78	....
Newark, deld.	61.02	61.52	62.02	62.52
Birdsboro, Pa. B10	58.00	58.50	....	....
Chester, Pa. C31	....	48.50	49.00	....
Philadelphia, deld.	....	50.16	50.66	....
Steelton, Pa. B2	58.00	58.50	59.00	59.50
Swedeland, Pa. A3	58.00	58.50	59.00	59.50
Philadelphia, deld.	59.66	60.16	60.66	61.16
Troy, N.Y. R2	58.00	58.50	59.00	59.50
Pittsburgh District				
Neville Island, Pa. P6	56.00	56.50	56.50	57.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	57.87	57.87	58.37
McKees Rocks, deld.	....	57.54	57.54	58.04
Lawrenceville, Homestead, Wilmerding, Monaca, deld.	....	58.16	58.16	58.66
Verona, Trafford, deld.	58.19	58.69	58.69	59.19
Brackenridge, deld.	58.45	58.95	58.95	59.45
Bessemer, Pa. U5	56.00	....	56.50	57.00
Clairton, Rankin, So. Duquesne, Pa. U5	56.00	....	....	....
McKeesport, Pa. N3	56.00	....	....	57.00
Midland, Pa. C18	56.00	....	....	....
Monessen, Pa. P7	56.00	....	....	....

	Basic	No. 2 Foundry	Malleable	Bessemer
Youngstown District				
Hubbard, O. Y1	....	....	56.50	....
Sharpsville, Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield, O. deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie, Pa. I-3	56.00	56.50	56.50	57.00
Everett, Mass. E1	60.50	61.00	61.50	....
Fontana, Calif. K1	62.00	62.50	....	....
Geneva, Utah C11	56.00	56.50	....	....
Granite City, Ill. G4	57.90	58.40	58.90	....
Ironton, Utah C11	56.00	56.50	....	....
LoneStar, Texas L6	62.00	62.50*	62.50	....
Minnequa, Colo. C10	58.00	59.00	59.00	....
Rockwood, Tenn. T2	....	52.50*	56.50	....
Toledo, O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grade. †Phos., 0.30 max.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.00 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson, O. G2, J1	$65.00
Buffalo H1	66.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Niagara Falls, N.Y. P15	$80.50
Keokuk, Iowa, Openhearth & Fdry, freight allowed K2	85.00
Keokuk, OH & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	88.00
Wenatchee, Wash. OH & Fdry, freight allowed K2	85.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate A7	$61.00
Rockwood, Tenn. T3	70.00
Steelton, Pa. B2	64.00
Philadelphia, deld.	67.55
Troy, N.Y. R2	64.00

Warehouse Steel Products

Representative prices, cents per pound, subject to extras, f.o.b. warehouse. City delivery charges are 20 cents per 100 lb except Birmingham and St. Paul, 15 cents; Philadelphia, New York, Boston and Los Angeles, 10 cents; Buffalo, 25 cents on C.R. and galvanized sheets, C.F. and alloy bars and 20 cents on other commodities; Houston, Seattle, Spokane, Wash., no charge.

	SHEETS				STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	Stainless Type 302‡‡	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††‡		Carbon	Floor
Baltimore	6.02	7.51	7.79	....	6.69	...	6.68	8.52[6]	12.04	6.72	6.37	7.76
Birmingham	6.35	7.35	8.25[3]	....	6.60	...	6.50	9.10	....	6.65	6.65	8.45
Boston	7.23	8.23	9.52	44.78[9]	7.47	...	7.20	8.60	12.45	7.49	7.37	8.50
Buffalo	6.35	7.40	8.79	....	6.70	...	6.50	7.85	12.15	6.72	6.65	7.90
Charlotte, N. C.	6.95	7.80	8.69	....	6.90	...	7.10	8.37	....	7.10	7.10	8.37
Chicago	6.38	7.38	8.30	45.55	6.62	...	6.51	7.50	11.90	6.69	6.52	7.64
Cincinnati	6.49	7.37	8.30	45.80	6.86	...	6.75	7.80	12.15	6.86	6.81	7.89
Cleveland	6.38	7.38	8.45	45.66	6.72	...	6.57	7.60	11.96	7.02	6.69	7.81
Detroit	6.57	7.57	8.58	43.50	6.90	7.36	6.79	7.79	12.10	7.16	6.80	7.83
Erie, Pa.	6.35	7.38	8.30	....	6.70	...	6.50	7.45[4]	....	6.69	6.52	7.64
Houston	7.35	7.80	9.93	....	7.70	9.30	7.70	9.50	....	7.60	7.35	8.75
Los Angeles	7.40	9.25	9.85	50.15	7.75	11.75	7.35	10.05	13.20	7.55	7.35	9.45
Milwaukee	6.47	7.47	8.39	....	6.71	...	6.60	7.69	11.99	6.86	6.61	7.73
Moline, Ill.	6.73	7.73	8.65	....	6.97	...	6.86	7.85	....	7.04	6.87	...
New York	6.97	7.91	8.79	44.45	7.56	...	7.37	8.73[6]	12.28	7.38	7.27	8.68
Norfolk, Va.	7.00	...	...	....	7.10	...	7.10	8.60	....	7.10	7.10	7.95
Philadelphia	6.19	7.44	8.26	41.98[9]	6.96	8.80	6.74	8.36[6]	12.10	6.54	6.49	7.51**
Pittsburgh	6.38	7.38	8.30	45.50	6.72	...	6.51	7.85	11.90	6.69	6.52	7.64
Portland, Oreg.	7.60	8.75	9.35	48.50	7.85	...	7.55	10.95	14.00	7.50	7.45	9.35
Richmond, Va.	6.43	7.39	8.67	....	6.77	...	6.71	8.33	....	7.08	6.65	8.08
St. Louis	6.67	7.67	8.59	43.89	6.91	...	6.80	7.89	12.19	7.09	6.81	7.93
St. Paul	7.04	8.04	8.96	....	7.28	...	7.17	8.26	....	7.35	7.18	8.30
San Francisco	7.55	8.95	8.70	51.65	7.80	...	7.35	10.05	13.20	7.50	7.40	9.45
Seattle	8.10	9.80	10.15	50.50	8.20	...	7.80	10.95	13.65	7.75	7.80	9.60
Spokane	8.35	9.65[7]	10.05	....	7.80	...	7.80	10.85‡‡	14.40	7.45	7.55	9.60
Washington	6.70	7.99	7.97	....	7.37	...	7.38	9.09	....	7.31	7.06	8.16

*Prices do not include gage extras; †prices include gage and coating extras, based on 11-cent zinc except in New York, Philadelphia, Los Angeles, Cincinnati, Cleveland (11.50-cent zinc) and in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extra; §as rolled; **¼-in. and heavier; ††as annealed; ‡‡prices include $2 for crating; §§ under ⅛-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over, except in Seattle, 2000 to 9999 lb; stainless sheets, 8000 lb except in New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999; [2]—500 to 9999 lb; [4]—4000 lb and over; [6]—1000 to 1999 lb; [8]—1000 lb and over; [7]—1500 lb to 3999 lb; [9]—f.o.b. local delivery in lots of 10,000 lb and over.

COMMEMORATIVE MEDALLION OF BRISTOL BRONZE.
EXECUTED BY MEDALLIC ART CO., NEW YORK

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THE 50,000,000TH GENERAL MOTORS CAR

It's a giant step from the first General Motors car *(a Cadillac)* in 1908, to the 50,000,000th car *(a Chevrolet)* in 1954. And through the years, General Motors has faithfully built up quality along with quantity, so that today it can be said that "never have so many been offered so much for so little."

So it is a special satisfaction to Bristol to be able to say that there is Bristol Brass in the cooling system of many General Motors cars built today. And it is an added satisfaction to record here, also, the fact that the commemorative medallion shown above is made of Bristol bronze.

To General Motors, on this momentous anniversary, a sincere salute, together with the hope that "the dreams of today will be surpassed by the realities of tomorrow."

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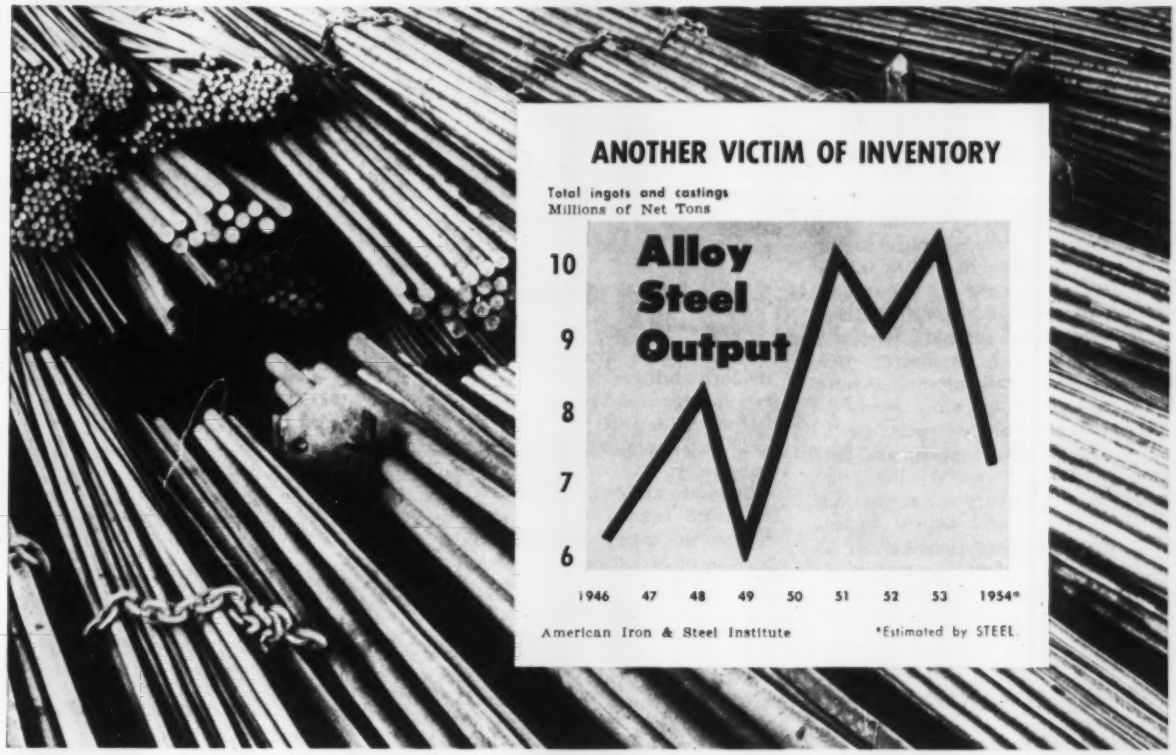

Republic Steel Corp.

Production hit the skids this year, but . . .

Alloy Steel Makers See Good Business Ahead

WITH REDUCTION of inventory troubles, alloy steel makers can look forward to a brisk ending of 1954 and a spirited send-off in 1955. Sales and bookings are better than anytime since August, 1953, and the industry is taking a less jaundiced look at the inroads carbon steel is making in their business.

Heavy inventories were probably a bigger headache to the specialty steel than any other segment of the industry in 1954. It is impossible to say when the build-up began, but one producer reports that heats of electric steel bought in early 1953 by a fabricator are just now being used. That is not an isolated case. In early '53, many manufacturers paid premium prices for alloy ingots just to get what steel they could. It was good business for the producers then, but the day of reckoning had to come.

Good News—But now it is over for the most part. Republic Steel Corp.'s Central Alloy District at Canton and Massillon, O., which reached the bottom of the slump in early 1954, reports operations for the week ended Dec. 11 were 75 per cent of capacity. October bookings were the best in 15 months, and November was even better. The first quarter of next year looks like it will be just as good—and maybe better.

Big reason for the increased production, of course, is the return of high production in the auto industry, alloy's biggest user. Warehouse business also has been good. But perhaps of greater importance is the fact that orders show a better diversification than they have for many months. Customers who haven't been in the market for many-a-moon are showing up, giving production a stability which the automakers alone cannot give it.

Hot Item—The improvement seems to be across-the-board, too, cold-finished as well as hot-rolled. Although it represents a small portion of the cold-finished market, the aircraft industry seems to be holding its own. One producer says if all cold-finished alloy business were as good as aircraft right now, he'd be operating at about 85-90 per cent of capacity. It's true that production of reciprocating engines, heavy users of cold-finished bars, is gradually being reduced in favor of jets. But aircraft specialists in the Business & Defense Services Administration Shipbuilding, Railroad, Ordnance and Aircraft Division say the end of reciprocating engines for military use is nowhere in sight. It is estimated that use of cold-finished bars in these engines is 3 to 5 per cent by weight—low alloys 65 to 75 per cent.

In addition, as jets strive for greater speeds their use of alloys will increase. Present use is between 30 and 40 per cent by weight. Fasteners made of alloy cold-heading wire are becoming increasingly important. As the speed of these engines reaches 660 to 1330 miles per hour at 35,000 feet altitude (Mach 1 to Mach 2), the engine is no longer hot at one end and cool at the other. It is hot all over. Alloy steel seems to be the only answer to the problems caused by this heat.

Changing Thoughts—Alloy producers have viewed with alarm the growing use of carbon steel in place

of their product, especially when automotive axles, a large tonnage product, made the switch. They say the trend has made it practically impossible for a strictly alloy plant to be self-sustaining. Now, however, some alloy men see the practical end of the substitution, with a possible reversal on a small scale. Advances in induction heating have made special carbon steels applicable for jobs formerly thought secure in the alloy fold. But some of those uses are finding that alloy is still the best in the long run. In addition, new developments, such as aircraft fasteners and the gas turbine, promise a future market for alloy steels.

Even if carbon steel were to increase its inroads, chances are that alloy producers would not "go under." Such carbon steels are usually of a special nature and of such quantities that they cannot be produced economically in what is generally regarded as a carbon mill. Much of that production will help fill out alloy mill order books and keep the plants on a self-sustaining basis.

Tool Steel . . .

Tool Steel Prices, Page 154

Shipments of high speed and tool steel (excluding hollow drill steel) totaled 6587 net tons in October, reports the American Iron & Steel Institute. This was an increase compared with the September total of 6269 tons, but was down substantially from the 9496 tons shipped in October, 1953.

Total shipments in the ten months ended October were 69,521 net tons. This compares with 99,820 in the like period of last year.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 151 & 152

Sheetmakers are still building order backlogs in cold-rolled and galvanized sheets.

Delivery promises on cold-rolled now average around 7 to 8 weeks and on continuous hot-dipped galvanized longer, ranging from 3 to 6 months, though the careful shopper can still pick up tonnage occasionally for shipment under 3 months.

Noncontinuous hot-dipped galvanized sheet shipments are somewhat more extended than they were, with 6 to 7 weeks about the best that can be done. Hot-rolled carbon sheets, however, still can be obtained for delivery within four weeks.

Demand for most sheet specialties is more than holding its own. This is particularly true of stainless strip.

Chicago district mills are heavily booked up. No early easing in demand is seen though automotive buying isn't quite so intense as it was.

A new 6-stand hot mill went into operation at McLouth Steel Corp.'s Trenton, Mich., plant last week. The $25 million mill, capable of producing sheet steel up to 60-in. wide, has a capacity of 150,000 tons monthly.

Structural Shapes . . .

Structural Shape Prices, Page 150

Considerable structural work, particularly bridges, continues to come out for figures. There is some leveling off in demand reported, but fabricators regard this as seasonal and temporary.

They are anticipating excellent first half 1955 volume. Some express confidence the entire year will witness a high level operation in the structural field. This optimism, however, is not altogether supported by the prices quoted on fabricated material.

With the slowdown in industrial construction wide flange beams, which have been in tight supply all year long, are easier to obtain. Most contractors are keeping inventories of steel as low as possible.

About 52,400 tons of structural steel and 14,200 tons of reinforcing bars will be required for the $130 million Baltimore harbor tunnel and approaches.

Wire . . .

Wire Prices, Pages 152 & 153

Demand for a broader range of finished wire products has extended some deliveries about two weeks. While there are openings in January for fine wire, schedules for next month on other industrial items are about filled.

Buying of manufacturers' wire is heavier, also cold heading stock, with indications consumer procurement will be increased after year-end.

Plates . . .

Plate Prices, Page 150

Carbon plates can still be ordered for shipment before the end of this year, and indications are there will not be much change in market conditions before next quarter.

Most platemakers see little important change in the market until railroad and ship demand spurts. Pickup in activity is not expected in the East until fabricated line pipe business takes a turn for the better.

New England fabricating shops are covered into January on tonnage needed, and they are able to obtain fill-in requirements under two weeks.

Steel Bars . . .

Bar Prices, Page 150

Although hot-rolled carbon bar delivery promises are a shade more extended than they were a month or so back, consumers are still able to obtain shipments on some specifications before the end of this year.

Cold-drawn bars also can be obtained for fairly prompt shipment because converters can ship from stock. This does not apply to all specifications, of course, but it does to a fair range of the more popular requirements. Even where work has to be processed from hot stock on hand, deliveries can be had before end of the year in certain cases.

Demand for bars in general is expanding slowly.

Warehouse . . .

Warehouse Prices, Page 155

Mills maintain quick order handling and delivery in products other than sheets. So they are handling many small orders that otherwise would go to warehouses. At the secondary level, prices are highly competitive.

Result is that distributors' bookings in December are barely holding at the November rate and may slide off a little due to seasonal factors. Over the last month, sheet sales have registered the greatest gain. With industrial construction slowing, plate and structural sales are off.

Tubular Goods . . .

Tubular Goods Prices, Page 154

Specialty tubing sales are slow, but mechanical tubing demand shows an increase. Other tubular goods, including seamless for oil country use, are selling steadily, but production is well below capacity.

Tubing sellers on the West Coast report a steady influx of German pipe is disturbing the market in that area, foreign tonnage cutting deeply into sales of domestic pipe.

Pig Iron . . .

Pig Iron Prices, Page 155

The optimism of pig iron producers is based on prospects for heavy automotive requirements in the early moths of 1955 and a pickup in production of agricultural implements. Gray iron foundry operations this month are expected to show only the usual seasonal drop from the November level. Consumers in general are buying on a hand-to-mouth basis to keep year-end inventories as low as possible.

No change in pig iron prices on Mystic Iron contracts is expected for the first quarter.

Why Moly alloy steels are in your future

RIVET SET LIFE INCREASED 30 TIMES

with

Moly *tool steels*

the part	**RIVET SETS**
the problem	Steel for hot rivet sets must be resistant to shock and to softening on contact with the hot rivets.
the pay-off	A chromium-molybdenum tool steel with about 0.5% C, 3.2% Cr and 1.4% Mo has proved far superior to carbon tool steel. Most of the results obtained indicate rivet sets of this alloy steel will last 20 to 50 times as long as similar sets of carbon tool steel. In one specific instance, a hot rivet set of the chromium-molybdenum tool steel drove over 27 times more rivets than sets made of carbon tool steel. The alloy-steel rivet set was still in good condition after driving 43,094 rivets, while the carbon-steel rivet sets drove an average of only 1566 rivets under similar conditions before recupping was required.

If you make, use, specify or buy steels you need a copy of "ALLOY STEELS PAY OFF"

Such topics as:

Air valve stems on coal washers, anchor chain, annealing retorts, ball cages in universal joints, band saws, bolts, boring bars, bridges, bumpers for passenger cars, caustic evaporators, centralization feed pumps.

This big, fully-documented 207 page book gives more than 50 complete case histories high-lighting the many advantages of alloy steel usage... such as outlined above. And each case history is an idea-starter of its own! Everything from "ANNEALING RETORTS" to "TRIMMER BLADES". Get your copy today. Address Dept. 3, on your letterhead, please. *Climax Molybdenum Company, 500 Fifth Avenue, New York 36, N. Y.*

This advertisement is printed in one shade of molybdenum orange, a pigment widely used for its striking color and good coverage — ideal for paint on industrial equipment . . . brings high visibility that means extra safety.

MS4-8

CLIMAX MOLYBDENUM

Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.

(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $190, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, Philo, O.; Sheffield, Ala.; Portland, Oreg., and Tacoma, Wash. Add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%) Lump $198 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 76%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max, 0.07% C, 29.95c per lb of contained Mn, carload packed 30.7c, ton lots 31.8c, less ton 33c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices 3c for max, 0.30% C, 3.5c for max 0.50% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max). Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electromanganese: Min carloads, 30c; 2000 lb to min carloads, 32c; 250 lb to 1999 lb 34c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-85%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.00c per lb of alloy, carload packed, 11.75c, ton lots 12.65c, less ton 13.65c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 24.75c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max, 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. S M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, S M x D, 18.35c per lb of alloy; ton lot 19.2c; less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 24.75c per lb of contained chromium plus 12c per pound of contained silicon; 1" x down, bulk 24.90c per pound of contained chromium plus 12.2c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Chromium Metal: (Min 97% Cr and 1% Fe). Contract, 1" x D; packed, max 0.50%, carload $1.16, ton lots $1.18; less ton $1.20. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 9c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 50-55%, Si 2-3.5% max, C 0.5-1% max). $3.10. **Primos and High Speed Grades** (V 50-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si, packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12c per lb of contained Si, carload packed 13.6c, ton lot 15.05c, less ton 16.7c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.7c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per pound contained silicon; carload packed 14.85c; ton lots, 16.05c; less ton, 17.4c, delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.4c per lb of contained Si, carload packed 15.7c, ton lot 16.85c, less ton 18.1c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 17.25c per lb of contained Si, carload packed 18.45c, ton lot 19.4c, less ton 20.45c. Delivered. Spot, add 0.25c.

Silicon Metal: (Mn 97% Si and 1% max Fe). C.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.5c for max, 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analysing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.25c per lb of alloy, ton lots packed 10.15c, 200 to 1999 lb 10.50c, smaller lots 11c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max). Contract, c.l. lump, bulk 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 25.25c per lb of alloy, ton lot 26c, less ton 27.25c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min M) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) Contract, lump, carloads 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.65c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.05c per lb of briquet, c.l. packaged 12.85c, ton lot 13.65c, less ton 14.55. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c per lb of briquet, c.l. packaged 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.75c per lb of briquet. Packed c.l. 7.55c, ton lot 8.35c, less ton 9.25c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.9c. Packaged c.l. 7.7c, ton lot 8.5c, less ton 9.4c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.80 per lb of contained W; 2000 lb W to 5000 lb W, $3.90; less than 2000 lb W, $4.02, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $12 per lb of contained Cb, less ton $12.05. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $6.25 per lb of contained Cb plus Ta, deld.; less ton lots $6.30.

Silicax Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy; ton lots 18.50c; less ton lots 20c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 16.6c per lb of alloy; ton lots 18.10c; less ton lots 19.35c, f.o.b. Niagara Falls; freight allowed to St. Louis.

Siminal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 15.50c. Packed c.l. 16.50c, 2000 lb to c.l. 16.75c, less than 2000 lb 17.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, Pa., $1.32 in all sizes except powdered which is $1.41; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., $1.13.

COPPER DETERMINATION

Alloymet 2030 (65% Nickel 30% Copper 5% Iron)*

A product of close Metallurgical CONTROL
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Pre-alloyed master alloys are leaving an indelible mark on the iron and steel industry. The element of human error is reduced many fold, since a single alloying agent, *ALLOYMET* 2030 ingot or shot, can replace many separate inoculants. A single trial of Alloymet 2030 or its companion alloys will make you an "Alloymet regular."

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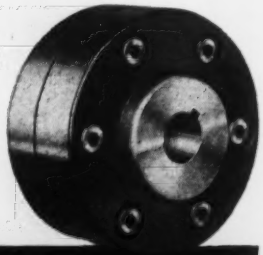

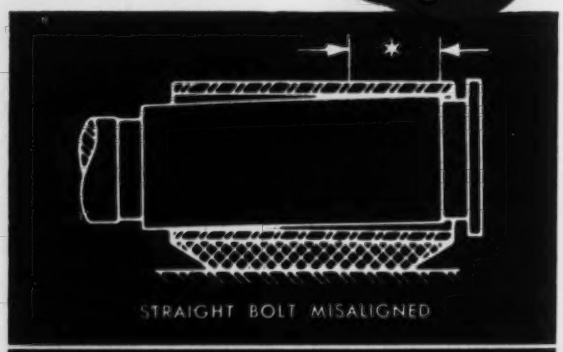

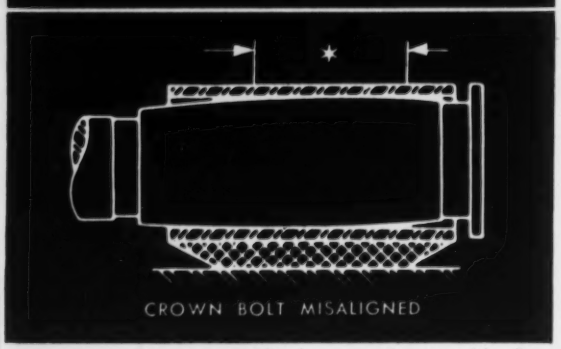

*Displacement of center of loading.

The crowned bolt in De Laval crown couplings increases the life of the rubber bushing by distributing stresses over a greater area. That means 1. Bushing and bolt are subject to lower unit pressures, less deformation and less wear. 2. Greater misalignment is permissible. 3. Vibration is most effectively dampened. • *Bulletin 2203 contains complete selection data on De Laval crown couplings. Send for your copy.*

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DE LAVAL STEAM TURBINE COMPANY

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BROWNING ELECTRIC TRAVELING CRANES AND HOISTS up to 125-TON CAPACITY

VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland), OHIO

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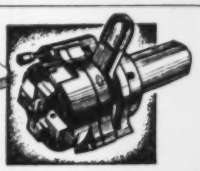

famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

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for Corrugating and Complete Line of Culvert Equipment—Slitting and Coiling Equipment for Ferrous and Non-Ferrous Material in All Capacities—Warehouse and Steel Mill Cut to Length Lines for Shearing and Levelling Sheets from Coils—Shears for Shearing Sheets and Plates Both Underdriven and Overdriven Types in Capacities to 1¼" Plate.

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By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages **4 tables**
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Ores

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter; gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%	20.00
N. African hematite (spot)	nom. 20.00-22.00
Brazilian iron ore, 68-69% (spot)	25.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, good commercial quality	$25.00-$26.00
Domestic scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, 90c-92c per long ton unit c.i.f. U. S. ports, duty for buyer's account: 46-47%, 80c.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $40.00-$42.00
48% 3:1	42.00-44.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	31.00-32.00

Domestic

(Rail nearest seller)

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb, Mo content mines unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$3.35-$3.85
60-65%	4.00-4.35

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Pueblo, Colo., $94; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $114; Salina, Pa., $119; Niles, O., $125; Los Angeles, Pittsburg, Calif., $137.20.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $120; Warren, Niles, O., Hays, Pa., $125; Morrisville, Pa., $123.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $130; Cutler, Utah, $121.55; Los Angeles, $127.85.

Super Duty: Hays, Sproul, Pa., Warren, Windham, O., Athens, Tex., $137; Morrisville, Pa., Niles, O., $140; Joliet, Ill., $143.

Semisilica Brick (per 1000)

Clearfield, Pa., $130.

Insulating Fire Brick (per 1000)

2300° *F:* Massillon, O. $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick (per 1000)

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Mo., $77.50; Wellsville, O., $81.50; Clearfield, Pa., Portsmouth, O., $87; Perla, Ark., $109; Los Angeles $110.25; Pittsburg, Calif., $111.30.

High-Alumina Brick (per 1000)

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $181; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., Clearfield, Pa., $225; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $260; Danville, Ill., $258; Clearfield, Pa., $267.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $147; Clearfield, Pa., $148.50; St. Louis, $159.30; Athens, Tex., $155.

Nozzles (per 1000)

Reesdale, Pa., $234.70; Johnstown, Pa., $240.70; Clearfield, Pa., $241.40; St. Louis, $259.45; Athens, Tex., $247.70; Bridgeburg, Pa., $267.50.

Runners (per 1000)

Reesdals, Johnstown, Bridgeburg, Pa., $183.50; Clearfield, Pa., $185.50; St. Louis, $195.80; Athens, Tex., $191.80.

Dolomite (per net ton)

Domestic dead-burned bulk; Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Narlo, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $15.10; Dolly Siding, Bonne Terre, Mo., $13.65.

Magnesite (per net ton)

Domestic, dead-burned bulk, ¾-in. grains with fines: Luning, Nev., Chewelah, Wash., $38.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.50-$14.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearny, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.05
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Buffalo, ovens	25.00
Buffalo, deld.	26.25
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.00
Swedeland, Pa., ovens	23.00
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, O., deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Pontiac, deld.	27.06
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg	32.00-35.00
Industrial xylol	32.00-35.00

Per ton, bulk, ovens

Sulphate of ammonia	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $35-$36; 70%, $32-$33; 60%, $28-$29. Imported, net tons, duty paid, metallurgical grade: European, $28-$30; Mexican, $25.50.

Electrodes

(Threaded with nipple, unboxed f.o.b. plant)

Diam.	Length	Per 100 lb
Inches		
GRAPHITE		
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5⅛	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18, 20	72	20.00
CARBON		
40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

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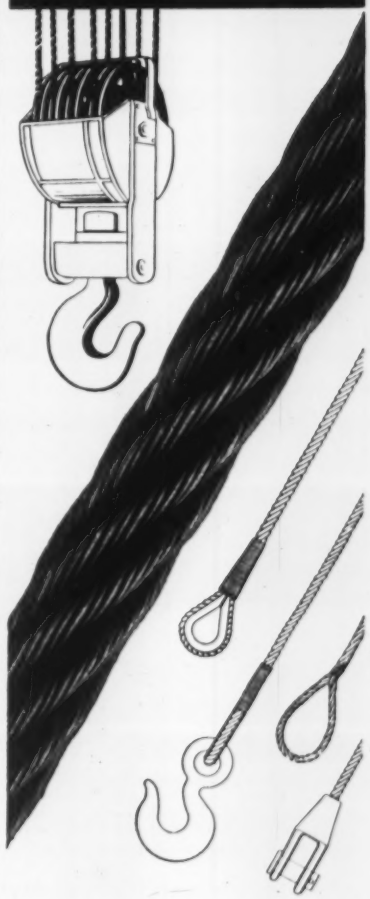
wire rope



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Established 1871

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4225 tons, five turnpike bridges, Jersey City, N. J., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

2305 tons, Sutton House, 405 East 52nd St., New York, Kokkins & Lyras, general contractors, to Harris Structural Steel Co., that city.

1900 tons, Diamond Club, Jewelers Exchange, New York, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

1027 tons, state turnpike bridge work, contract N-12, Jersey City, N. J., through Poirier & McLane Corp., to Delaware Steel Fabricators Corp., Wilmington, Del.

850 tons, main unit, state school, Selinsgrove, Pa., to Belmont Iron Works, Eddystone, Pa.

720 tons, jail, Hempstead, Long Island, N. Y., through John T. Brady & Co. Inc., to Simon Holland & Son Inc., Brooklyn, N. Y.

680 tons, municipal laboratory and mortuary building, Brooklyn, N. Y., through Cerace & Castagna, general contractors, to Schacht Steel Construction Inc., New York.

650 tons, alterations, Lumbermen's Mutual Insurance Co. building (formerly Ritz Carleton Hotel) North Broad St., Philadelphia, to Belmont Iron Works, Eddystone, Pa.

615 tons, bridge, Meadow Brook parkway, contract 2, Nassau county, New York, through Hendrickson Bros., general contractors, to American Bridge Division, U. S. Steel Corp., Pittsburgh.

600 tons, plant and office building, Bridgeport Thermostat Division, Robertshaw-Fulton Controls Co., Milford, Conn., to Belmont Iron Works, Eddystone, Pa. through John Zandenella, Bridgeport, general contractor; 50 tons reinforcing steel to Ceco Steel Co., Jersey City, N. J.

440 tons, Catholic High School, Pottsville, Pa., to Weatherly Steel Co.

340 tons, state bridge, Delaware county, Pa., to Mayer Pollock, Pottstown, Pa.

330 tons, service garage, Railway Express Agency, Sunnyside, Long Island City, N. Y., through Wortmann & Son, general contractors, to Simon Holland & Son Inc., Brooklyn, N. Y.

325 tons, Holy Rosary school and convent, Bronx, New York, through T. G. K. Construction Co., general contractor, to Dreier Structural Steel Co., Long Island City, N. Y.

300 tons, regional technical high school, Willimantic, Conn., to Connecticut Steel Co., New Haven, Conn., and Norwich Steel & Supply Co., Norwich, Conn., through Felix Buzzi & Son, Torrington, Conn., general contractors.

250 tons, high school, Plainfield, Conn., to Connecticut Steel Co., New Haven, Conn., through Fusco-Amatruda Co., New Haven, Conn., general contractor; reinforcing bars to Capitol Steel Corp., New York.

250 tons, high school, Hopkinton, Mass., to A. O. Wilson Structural Co., Cambridge, Mass., through John Capobianco Co., Boston, general contractor; also 100 tons of bar joists to Truscon Steel Division, Republic Steel Corp., Boston, and 50 tons of reinforcing bars to Northern Steel Inc., Medford, Mass.

200 tons, Pennsylvania railroad bridge, Middlesex county, N. J., to Irvington Iron & Steel Co.

155 tons, office and publishing building, Morristown, N. J., through William L. Blanchard Co., to Bethlehem Steel Co., Bethlehem, Pa.

125 tons, inner cofferdam bracing, Navy Yard, Brooklyn, New York, through Corbetta Construction Co., general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

STRUCTURAL STEEL PENDING

3600 tons, state bridge work, Beaver county, Pa., bids Jan 7.

750 tons, eight bridges, Weston-Natick-Wayland, Mass.; bids Dec. 14 to Massachusetts Turnpike Authority, Boston; also 140 tons of steel sheet piling.

510 tons, two stringer bridges, Dedham-Westwood, Mass.; Charles Capone Construction Co. Inc., Dedham, low on general contract.

450 tons, Catholic High School, Norristown, Pa., bids Dec. 21.

425 tons, Glendo dam, Wyoming; general contract awarded.

350 tons, National Guard hangar; bids to U. S. Engineer, Portland, Oreg., Dec. 21.

300 tons, Radio Corp. of America office and warehouse, Lancaster, Pa.

225 tons, Washington state Whatcom county bridge; bids to Olympia, Wash., Dec. 21.

205 tons, 4-span steel beam bridge, Spaulding turnpike, Dover, N. H.; bids Dec. 13, Concord, N. H.; also 65 tons, steel bearing piles and 45 tons of reinforcing steel.

150 tons, state bridges, Porter county, Indiana; bids Dec. 15, Indiana Toll Road Commission, Indianapolis.

150 tons, two small hangars, McChord Air Field, Washington state; general contract to Roy T. Earley Co., Tacoma, Wash., low at $259,523.

100 tons, plant building, du Pont interests, Henry Clay, Del.; bids Dec. 15.

100 tons, Washington state Grant county undercrossing; bids to Olympia, Wash., Dec. 16.

100 tons plus, 1036-ft multiple span, Sustina river, Alaska; also 165-ft steel deck truss span, same project; and 156-ft multiple I-beam bridge, Comyn creek, Alaska; bids to Alaska Road Commission, Juneau, Dec. 28.

REINFORCING BARS . . .

REINFORCING BARS PLACED

925 tons, schedule D, Washington state, First Ave. south bridge, Seattle, to Northwest Steel Rolling Mills; general contract to Roy T. Earley Co., Tacoma, Wash., at $1,008,944.

600 tons, schedule C, Washington state, First Ave. south bridge, Seattle, to Soule Steel Co., Seattle; Peter Kiewit Sons Co., Seattle, general contractor.

100 tons, Keller warehouse project, Seattle, to Soule Steel Co., Seattle.

100 tons or more, 15,700-ft reinforced concrete water supply line, St. Helens, Oreg., to American Pipe & Construction Co., Portland, Oreg.

94 tons, utilidor project, Ladd Air Field, Alaska, to Bethlehem Pacific Coast Steel Corp.; Peter Kiewit Sons Co., Seattle, general contractor.

REINFORCING BARS PENDING

2000 tons, Glendo dam project, Wyoming; general contract to Lytle & Green, Sioux City, Iowa, low at $6,270,790.

1055 tons, eight bridges, Weston-Natick-Way-

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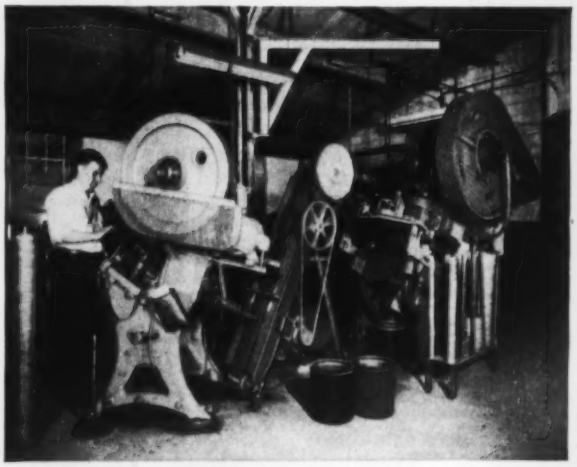

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THE HOMER MANUFACTURING CO. INC.
DEPT. 149 LIMA, OHIO

HOMER

. . . the FINEST in Permanent Magnetic Equipment for Industry

land, Mass.; bids Dec. 14 to Massachusetts Turnpike Authority, Boston.

1000 tons, also shapes for two bridges, Gorge dam expansion, Skagit river project; joint low bid to Seattle is $14,731,000 by Merritt, Chapman & Scott, New York, and Savin Construction Co., East Hartford, Conn.

530 tons, highway and bridges, Porter county, Indiana; bids Dec. 15, Indiana Toll Road Commission, Indianapolis.

315 tons, Access road, New Commonwealth pier, Boston; bids Dec. 14.

215 tons, piers, Providence river bridge, Providence, R. I.; bids Dec. 15.

180 tons, Washington state Nooksack river bridge; bids to Olympia, Wash., Dec. 21.

100 tons plus, eight concrete grain storage bins, Irving elevator, Portland, Oreg.; Henry George & Sons, Spokane, Wash., general contractors.

100 tons, Idaho state underpass, Twin Falls county; general contract to Neilsen & Smith, Twin Falls, low at $61,870.

100 tons or more, 6-story, $720,000 wing addition to Halladay Park Hospital, Portland, Oreg.; bids Dec. 23.

PLATES . . .

PLATES PLACED

1600 tons, penstocks, California-Oregon Power Co. project near Medford, Oreg., to Consolidated Western Steel Division, U. S. Steel Corp., San Francisco.

150 tons, elevated water tank, veterans' hospital, Hines, Ill., to Chicago Bridge & Iron Co., Chicago, $192,850.

130 tons, storage tank, Excello Corp., New Haven, Conn., to Bethlehem Steel Co., Bethlehem, Pa.

PLATES PENDING

950 tons, estimated, 5200 linear ft, 36-in. steel pipe, water supply line; bids Dec. 20, purchasing agent, Arlington county, Virginia; alternate on reinforced concrete pipe.

850 tons, Glendo dam project, Wyoming; general contract by U. S. Department of the Interior to Lytle & Green, Sioux City, Iowa.

325 tons, two 450,000-gal. ground storage tanks, Naval Construction Battalion Center, Gulfport, Miss.; bids Dec. 22, Corps of Engineers, Charleston, S. C.; alternate on concrete. Tanks replace two 440,000-gal. units to be dismantled.

250 tons, elevated water tank; bids to Vancouver, Wash., Dec. 20.

200 tons, 500,000-gal. elevated water storage tank, Kingsville, Tex.; bids in to Corps of Engineers, Corpus Christi, Tex.

125 tons, 250,000-gal. elevated water tank, Bunker Hill Air Force Base, Peru, Ind.; bids Dec. 17, construction officer, Great Lakes, Ill.

100 tons, 300,000-gal water tank; bids to Gold Beach, Oreg., Dec. 17.

100 tons, 200,000-gal. elevated tank, Quartermaster Depot, Jeffersonville, Ind.

RAILS, CARS . . .

RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, 1300 freight cars, 500 seventy-ton gondolas going to the General American Transportation Corp., Chicago, 400 fifty-ton box cars to the Pullman-Standard Car Mfg. Co., Chicago, and 250 fifty-ton flat cars and 150 seventy-ton gondolas to the company's own shops.

Central of Georgia, eight 50-ton box cars, to the Pullman-Standard Car Mfg. Co., Chicago.

Erie, 50 roller-bearing flat cars for use in piggy-back service. The specially equipped flat cars with extra length of 75 feet to accommodate two large or three small highway trailers were orders from Bethlehem Steel Co. and will cost an estimated $550,000. Delivery is expected in late January.

Northern Pacific, 500 fifty-ton box cars, to own shops.

Wabash, three sleeping cars, to the Pullman-Standard Car Mfg. Co., Chicago.

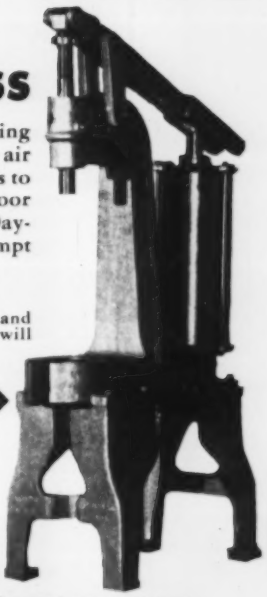
LOCOMOTIVES PLACED

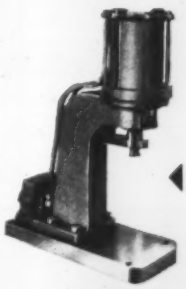
Northern Pacific, 33 diesel units, awarded as follows: fourteen 1750-hp road switchers, one 4-unit 7000-hp freight locomotive and eight 1200-hp switchers to the Electro-Motive Division, General Motors Corp., La Grange, Ill., and one 900-hp switcher and six 1600-hp road switchers to American Locomotive Co., New York.

SAVE!

WITH A HANNIFIN AIR PRESS

It's the ideal press for that occasional pressing job. These presses operate off ordinary shop air supply. They're fast and safe. Over 30 models to choose from...many for either bench or floor mounting. Capacities from ½ to 18 tons. Daylight to 46 inches...reach to 12 inches. Prompt delivery.





WRITE. Complete information and prices on Hannifin Air Presses will be sent on request.

6 Tons (Model B-2) One of more than 30 models. Press with base, $554.

1-ton Hand-D-Press. For small parts manufacturers. Press, $232.

Prices F.O.B. our press plant, St. Marys, Ohio, subject to change without notice.

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This sturdy unit takes a six-foot-wide bite in any kind of snow, loading from 7 to 12 cubic yards of snow per minute in trucks or throwing it clear. Builder is Krause Industries, Baraboo, Wisconsin and the snow blower is constructed to mount easily and quickly on the Hough Payloader Tractor-Shovel. A Wisconsin Heavy-Duty Air-Cooled Engine provides the power.

Equipment builders and buyers are choosing Wisconsin Engines over all other types in the 3 to 36 hp. range . . . as the most satisfactory and foolproof power to fit both the *job* and the *machine*. You'll find a model and size available to fit every power requirement . . . 4-cycle single-cylinder, 2-cylinder and V-type 4-cylinder models, 3 to 36 hp. Write for Bulletin S-164.

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World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

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STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

Scrap . . .

Scrap Prices, Page 168

Chicago — Far as new buying is concerned, activity in scrap is light and price changes are minor. But weakness is observed in blast furnace turnings and borings.

The Chicago Mercantile Exchange has authorized addition of contracts specifying No. 2 heavy melting steel scrap to those now traded. The new contracts on which trading starts Dec. 15, will call for delivery of the No. 2 grade at par if the original transaction was made in that grade. Delivery months of the two new contracts authorized will be February and April, 1955. Specifications will conform to those given in the current rules of the Exchange for No. 2 heavy melting.

Pittsburgh—Prices are holding in the absence of major buying. Most consumers have already placed orders for all the scrap they will need this month. New orders for remainder of December will be small.

Boston—Steel scrap prices are easing. Domestic buying is light and export loadings more uncertain. Usual differentials between steel grades are out of line, with No. 1 bundles selling $1.50 to $2 per ton higher than No. 1 heavy melting.

New York—Scrap brokers have reduced prices on No. 1 heavy melting steel and No. 1 bundles to $26-$27, on No. 2 heavy melting to $24-$25. Prices on machine shop turnings have dropped $1 a ton to a range of $9-$10, and short shovel turnings a half dollar to $12-$13.

Buffalo — The scrap market is steady, with prices unchanged. It's failure to develop a more pronounced show of strength is attributed to uncertainty over how long ingot operations will hold at current lofty levels. Dealers report available supplies ample to cover commitments. A fresh buying wave from Canadian sources is reported in the cast grades. Sales are within prevailing price ranges.

Philadelphia — A slightly easier tone is noted in the scrap market. No. 2 bundles are holding at $26.50 delivered, No. 1 busheling at $30 to $30.50, machine shop turnings at $18, short shovel turnings at $21 to $21.50, heavy turnings at $29.50 to $30. Among the cast grades, malleable is lower at $41.50 to $43, delivered, depending on grade.

Cincinnati—The scrap market is quiet. Prices are a little lower, the chief drop coming in No. 2 steel, down $2 to average $25-$26.

Detroit—Continued high automobile production, with resulting increased generation of scrap, tends to soften the market somewhat. Mills are buying No. 1 grades in quantity, but No. 2 grades and turnings reflect the availability of the more desirable items. No. 1 bundles are quoted at $27, No. 2 bundles $18, No. 1 busheling $26 and turnings $11.

Washington—Iron and steel scrap export quotas have been rejected by the Commerce Department, at least for the present. Tighter licensing rules for shipping metal out of the country, however, were set up to enable the Department to keep closer watch over export volume and destination. At the same time licensing is continued through the first quarter without quantitative limitations.

Some 395,700 short tons of ferrous scrap were licensed for export in the second quarter of 1954, 845,300 tons in third quarter and 842,225 tons thus far in fourth quarter. Gross actual shipments, meanwhile, amounted to 224,198 tons in first quarter, 204,410 in the second and 430,934 in the third.

Excluding shipments of 42,035 short tons to Canada, and taking into account imports of 116,161 short tons, net licensed exports for the first 9 months of 1954 were 701,337 short tons. Of this total, 45,562 was of offshore origin.

Birmingham—Local scrap demand has tapered off the last two weeks, but there has been some moderate buying by the district's two largest consumers. Export movement continues. Prices are unchanged.

St. Louis—Scrap trading is quiet and is expected to continue so through the remainder of this month. The mills are not pressing for shipments but are taking all the material offered at their prices.

Los Angeles — Although some increases in mill purchases of scrap have been noted of late, dealers claim their December sales volume will be at least 5 per cent under last December's. Reports of offshore scrap being received are unconfirmed.

(*Please turn to page* 170)

The Gripco Lock Nut one-piece design gives a tighter more positive holding action for faster application at less cost. And for 50 years the Gripco locking feature has proven itself by an ever increasing use. All-one-piece to cut initial cost—(no inserts, outside devices or complicated features) — the extreme holding or locking action is produced by a simple, vertical thread deflection. For stress, wear or vibration, a Gripco Lock Nut will hold tighter, wear longer. Impervious to oil or water. Write for samples and full details.

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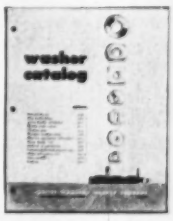


COMPANY

Moen & Connell Avenues
Joliet, Illinois
★

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Dec 8	$32.58
Dec. 1	32.58
Nov. Avg.	33.29
Dec. 1953	39.69
Dec. 1949	28.03

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plant)

No. 1 heavy melting..	32.00-33.00
No. 2 heavy melting..	28.00-29.00
No. 2 bundles	26.00-27.00
No. 1 bundles	32.00-33.00
No. 1 busheling	32.00-33.00
Machine shop turnings	15.00-19.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings.	22.00-23.00
Cast iron borings	22.00-23.00
Cut structurals, 5 ft lengths	35.00-36.00
Heavy turnings	29.00-30.00
Punchings & plate scrap	*37.00-38.00*
Electric furnace bundles	*37.00-38.00*

Cast Iron Grades

No. 1 cupola	36.00-37.00
Charging box cast	31.00-32.00
Heavy breakable cast.	30.00-31.00
Unstripped motor blocks	22.00-23.00
No. 1 machinery cast.	41.00-42.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
Rails, 2 ft and under	*46.00-47.00*
Rails, 18 in. and under	*47.00-48.00*
Rails, random lengths	*40.00-41.00*
Railroad specialties	37.50-38.50

Stainless Steel Scrap

18-8 bundles & solids	185.00-195.00
18-8 turnings	90.00-95.00
430 bundles & solids..	75.00-80.00
430 turnings	60.00-62.00

CLEVELAND

(Delivered consumer plant)

No. 1 heavy melting..	32.00-33.00
No. 2 heavy melting..	28.00-29.00
No. 1 bundles	32.00-33.00
No. 2 bundles	24.00-25.00
No. 1 busheling	32.00-33.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	20.00-21.00
Short shovel turnings..	20.00-21.00
Cast iron borings	20.00-21.00
Low phos.	34.00-35.00
Cut structural plate 2 ft and under	38.00-39.00
Alloy free, short shovel turnings	23.00-24.00
Electric furnace bundles	33.00-34.00

Cast Iron Grades

No. 1 cupola	44.00-45.00
Charging box cast	33.00-34.00
Stove plate	38.00-39.00
Heavy breakable cast..	30.00-31.00
Unstripped motor blocks	30.00-31.00
Brake shoes	31.00-32.00
Clean auto cast	44.00-45.00
No. 1 wheels	37.00-38.00
Burnt cast	29.00-30.00
Drop broken machinery	44.00-45.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
R.R. malleable	44.00-45.00
Rails, 3-ft and under	*46.00-47.00*
Rails, 18-in. and under	*47.00-48.00*
Rails, random lengths	*43.00-44.00*
Cast steel	36.00-37.00
Railroad specialties	36.00-37.00
Uncut tires	37.00-38.00
Angles, splice bars	*42.00-43.00*
Rails, rerolling	52.00-53.00

Stainless Steel (Brokers' Buying Prices)

18-8 bundles, solids	175.00-180.00
18-8 turnings	70.00-80.00
430 clips, bundles, solids	70.00
430 turnings	40.00-50.00

YOUNGSTOWN

(Delivered consumer plant)

No. 1 heavy melting..	34.00-35.00
No. 2 heavy melting..	29.00-30.00
No. 1 bundles	34.00-35.00
No. 2 bundles	26.00-27.00
Machine shop turnings	14.00-15.00
Short shovel turnings..	22.00-23.00
Cast iron borings	22.00-23.00
Low phos.	36.00-37.00
Electric furnace bundles	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00

CHICAGO

No. 1 heavy melting..	32.00-34.00
No. 2 heavy melting..	30.00-31.00
No. 1 factory bundles	34.00-35.00
No. 1 dealer bundles..	32.00-33.00
No. 2 bundles	23.00-24.00
No. 1 busheling	32.00-34.00
Machine shop turnings	16.00-17.00
Mixed borings, turnings	18.00-19.00
Short shovel turnings.	18.00-19.00
Cast iron borings	18.00-19.00
Cut structurals, 3-ft..	36.00-37.00
Punchings & plate scrap	36.00-37.00
Electric furnace bundles	34.00-35.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	32.00-33.00
Unstripped motor blocks	25.00-26.00
Clean auto cast	42.00-43.00
Drop broken machinery	42.00-43.00

Railroad Scrap

No. 1 R.R. heavy melt.	36.00-37.00
R.R. malleable	42.00-44.00
Rails, 2-ft and under	50.00-51.00
Rails, 18-in. and under	51.00-52.00
Angles, splice bars	43.00-44.00
Rails, rerolling	52.00-53.00

Stainless Steel Scrap

18-8 bundles & solids	175.00-180.00
18-8 turnings	75.00-80.00
430 bundles & solids..	65.00-70.00
430 turnings	30.00-40.00

Chicago Mercantile Exchange

No. 1 Heavy Melting (Week ended Dec. 8)

	High	Low	Close
Jan.	35.75	35.00	35.00*
Mar.	37.00	36.00	36.00

Sales (40-ton Units): 19 January; 9 March. *Nominal.

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting..	27.00
No. 2 heavy melting..	19.00
No. 1 bundles	*27.00*
No. 2 bundles	*18.00*
No. 1 busheling	*26.00*
Machine shop turnings	*11.00*
Mixed borings, turnings	*11.00*
Short shovel turnings..	14.00
Punching & plate scrap	28.50

Cast Iron Grades

Charging box cast	27.00
No. 1 cupola	34.00
Stove plate	30.00
Heavy breakable	25.00
Unstripped motor blocks	20.00
Clean auto cast	38.00
Malleable	30.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting..	30.00-31.00
No. 2 heavy melting	*25.00-26.00*
No. 1 bundles	30.00-31.00
No. 2 bundles	*20.00-21.00*
No. 1 busheling	30.00-31.00
Machine shop turnings	*16.00-17.00*
Mixed borings, turnings	*17.00-18.00*
Short shovel turnings	*17.00-18.00*
Cast iron borings	*17.00-18.00*
Low phos. 18-in.	*34.00-35.00*

Cast Iron Grades

No. 1 cupola	39.00
Heavy breakable cast.	*35.00*
Charging box cast	36.00
Drop broken machinery	45.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00
Rails, 18-in. and under	*46.00-47.00*
Rails, random lengths	*38.00-39.00*

PHILADELPHIA

(Delivered consumer plant)

No. 1 heavy melting..	32.00-32.50
No. 2 heavy melting	*29.00-29.50*
No. 1 bundles	32.00-32.50
No. 2 bundles	*26.50*
No. 1 busheling	*30.00-30.50*
Electric furnace bundles	33.50
Machine shop turnings	*18.00*
Mixed borings, turnings	19.00-19.50
Short shovel turnings	*21.00-21.50*
Structurals & plate	34.50-35.00
Heavy turnings	*29.50-30.00*
Couplers, springs, wheels	35.00
Rail crops, 2 ft & under	46.00

Cast Iron Grades

No. 1 cupola	35.00
Malleable	*41.50-43.00*
Heavy breakable cast..	36.00-36.50
Drop broken machinery	42.00-43.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*26.00-27.00*
No. 2 heavy melting	*24.00-25.00*
No. 1 bundles	*26.00-27.00*
No. 2 bundles	20.00-21.00
Machine shop turnings	*9.00-10.00*
Mixed borings, short turnings	11.00-12.00
Low phos. (structural & plate)	29.00-30.00
Short shovel turnings	*12.00-13.00*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	22.00-23.00

Stainless Steel

18-8 sheets, clips, solids	170.00-175.00
18-8 borings, turnings..	70.00-75.00
430 sheets, clips, solids	50.00
410 sheets, clips, solids	40.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*22.00-23.00*
No. 2 heavy melting	*16.00-16.50*
No. 1 bundles	*24.00-25.00*
No. 2 bundles	16.50-17.00
Mixed borings, turnings	10.00-10.50
Machine shop turnings	*7.50-8.00*
Short shovel turnings..	11.00-11.50
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast..	32.00-33.00

BUFFALO

No. 1 heavy melting..	30.00-31.00
No. 2 heavy melting..	27.50-28.50
No. 1 bundles	30.00-31.00
No. 2 bundles	25.50-26.50
No. 1 busheling	30.00-31.00
Machine shop turnings	18.00-19.00
Mixed boring, turnings	20.00-21.00
Short shovel turnings.	21.00-22.00
Cast iron borings	20.00-21.00
Low phos.	33.00-34.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	38.00-39.00
No. 1 machinery	43.00-44.00

Railroad Scrap

Rails, random lengths..	35.00-36.00
Rails, 3 ft and under.	42.00-43.00
Railroad specialties	36.50-37.50

BIRMINGHAM

No. 1 heavy melting..	26.00-27.00
No. 2 heavy melting..	24.00-25.00
No. 1 bundles	23.00-24.00
No. 2 bundles	19.00-20.00
Cast iron borings	16.00-17.00
Short shovel turnings.	16.00-17.00
Machine shop turnings	15.00-16.00
Electric furnace bundles	29.00-30.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	45.00-46.00
Stove plate	42.00-43.00
Bar crops and plate..	33.00-34.00
Structural plate, 2 ft	33.00-34.00
Unstripped motor blocks	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt.	30.00-31.00
Rails, 18-in. and under	40.00-41.00
Rails, rerolling	40.00-41.00
Angles, splice bars	38.00-39.00
Stand. steel axles	35.00-36.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting..	30.00
No. 2 heavy melting..	28.00
No. 1 bundles	30.00
No. 2 bundles	*23.50*
Machine shop turnings	13.00
Short shovel turnings.	15.00

Cast Iron Grades

No. 1 cupola	40.00
Charging box cast	32.50
Heavy breakable cast	32.50
Unstripped motor blocks	32.50
Brake shoes	30.00
Clean auto cast	41.00
Stove plate	35.00

Railroad Scrap

No. 1 R.R. heavy melt	35.00
Rails, 18-in. and under	46.00
Rails, random lengths.	43.00-45.00
Rail, rerolling	*51.00*
Angles, splice bars	40.00-41.00

SEATTLE

(Delivered consumer plant)

No. 1 heavy melting..	27.00
No. 2 heavy melting..	23.00
No. 1 bundles	21.00
No. 2 bundles	17.00
No. 3 bundles	13.00
Machine shop turnings	12.00
Mixed borings, turnings	12.00
Short shovel turnings..	12.00
Electric furnace, No. 1	32.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	32.00-35.00
Heavy breakable cast..	23.00
Unstripped motor blocks	25.00
No. 1 wheels	21.00
Stove plate(f.o.b. plant)	28.00
Brake shoes	28.00

Railroad Scrap (Delivered consumer plant)

Rails, random lengths..	30.00-34.00

LOS ANGELES

No. 1 heavy melting..	20.00
No. 2 heavy melting..	16.00
No. 1 bundles	20.00
No. 2 bundles	16.00
Machine shop turnings.	5.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	42.00-44.00

SAN FRANCISCO

No. 1 heavy melting..	24.00
No. 2 heavy melting..	20.00
No. 1 bundles	23.00
No. 2 bundles	18.00
No. 1 busheling	24.00
Machine shop turnings	6.00
Mixed borings, turnings	6.00
Short shovel turnings.	9.00
Cast iron borings	9.00
Cut structurals	25.00
Heavy turnings	9.00
Punchings & plate scrap	25.00
Electric furnace bundles	19.00

Cast Iron Grades

No. 1 cupola	43.00-46.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast..	36.00
Unstripped motor blocks	30.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	48.00

HAMILTON, ONT.

(Delivered prices)

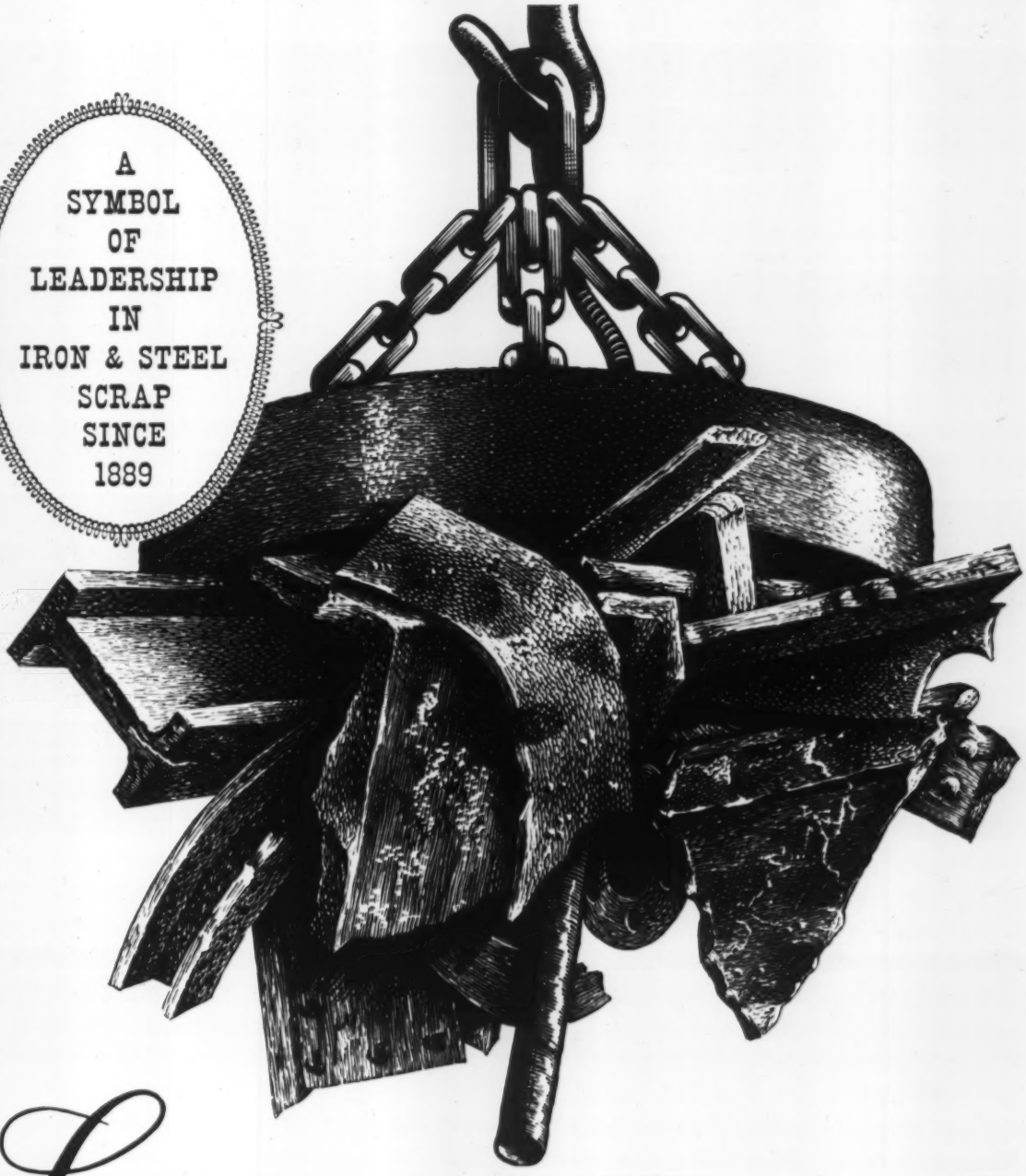
No. 1 heavy melting..	26.00
No. 2 heavy melting..	23.00
No. 1 bundles	26.00
No. 2 bundles	21.00
Mixed steel scrap	20.00
Mixed borings, turnings	12.00
Rails, remelting	35.00
Busheling, new factory: Prepared	24.00
Unprepared	20.00
Short steel turnings	12.00

Cast Iron Grades†

No. 1 machinery cast..	42.00-45.00

†F.o.b., shipping point.

A
SYMBOL
OF
LEADERSHIP
IN
IRON & STEEL
SCRAP
SINCE
1889



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BLAKE & JOHNSON
SINCE 1849
WATERVILLE 48, CONNECTICUT

(*Concluded from page* 167)

Seattle—While there is little activity in the scrap market in this area, prices are firm, with receipts and consumption continuing in balance.

Iron Ore . . .

Iron Ore Prices, Page 163

The 1954 Great Lakes shipping season is just about ended. Only a few vessels remain to tie up for the winter and most of these are Canadian.

The last iron ore cargo for the season has been brought down to the lower lakes, total season movement (preliminary figure) being 60,793,697 gross tons. This is more than 35 million tons under the record-breaking 95,844,449 tons brought down in the 1953 navigation season.

The 1954 lake ore movement was the smallest in 15 years, except in 1946 when shipments were curtailed by a strike.

CLASSIFIED

Help Wanted

IGNITRON ENGINEER CALIFORNIA B.S. or M.S. in E.E., U. S. citizen, with interest in and preferably experience with pumped-down Ignitron rectifier-inverters. Will assume part responsibility for magnet power supply on new Bevatron, world's largest particle accelerator. Excellent opportunity to work alongside fundamental nuclear research. Twenty minutes from metropolitan San Francisco. Salary open. Professional Personnel Office, University of California Radiation Laboratory, Berkeley 4, California.

IMPORTED PRECISION MEASURING INSTRUMENTS, Gageblocks, Height-gages, Vernier Calipers, Micrometers, Protractors, etc. Want experienced salesmen/agents having contacts with tool-, die-, machine, aircraft factories. AMERICAN EXPORT TECHNICIANS, INC., 2 Broadway, New York 4, New York.

SALES ENGINEER for large eastern steel plate fabricator. Must be thoroughly versed in all phases of Process Equipment such as Towers, Condensers, Autoclaves, Pipe fabrication, etc., both in steel and the alloys. Will operate out of metropolitan New York office and be willing to travel. Must have well-established reputation and reasonable following in the field. Salary Open. Reply Box 170, STEEL, Penton Building, Cleveland 13, Ohio.

METALLURGICAL OR CHEMICAL ENGINEERING GRADUATE wanted to assist Melting Department metallurgist in steel mill making high speed, tool, stainless, specialty steels and high temperature alloys. Reply giving details of education, experience, age, references, etc. Box 177, STEEL, Penton Building, Cleveland 13, Ohio.

METALLURGICAL GRADUATE with several years' experience for process development in steel mill making high temperature alloys, high speed, tool, stainless and specialty steels. Duties would involve development of processing procedures for new alloys as well as the improvement of processes for established alloys under direction of Process Development Metallurgist. Reply giving details of education, experience, age, references, etc. Box 178, STEEL, Penton Building, Cleveland 13, Ohio.

METALLURGIST FOR LABORATORY WORK in steel mill making high temperature alloys, high speed, tool, stainless and specialty steels. Work will include metallurgical examination of materials, writing of reports, conducting investigations of mill problems involving a large variety of alloys. Good opportunity for graduate with 1 to 3 years' experience. Reply giving education, experience, age, references, etc. Box 179, STEEL, Penton Building, Cleveland 13, Ohio.

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Surplus Pangborn Sandblast Parts, as listed below. In excellent condition. Will sell at ½ price. Only a few additional parts would have to be purchased to make complete unit:

1—Serial 1C3-51145 Elevator
1—Serial 1C3-51150 Elevator
1—Serial BVR7-51287 Abrasive Separator
1—Serial BVR7-51288 Abrasive Separator
1—Serial 1AU11-5211 Abrasive Tank
1—Serial 1AU11-523 Abrasive Tank
1—Type CH-2 Dust Collector
1—Sturtevant Silentvane Fan Blower; Size 70, Design 10, Style W-55570, Pangborn Serial 14K02-515

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RAILWAY CARS—
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"ANYTHING containing IRON or STEEL"

CLASSIFIED

Positions Wanted

PLANT AND PRODUCTION MANAGER, Engineering Graduate (M.I.T.) indoctrinated in practical operating experience. Proven record of accomplishment in efficient plant supervision, control, and cost reduction coupled with amicable labor relations. Reply Box 134, STEEL, Penton Building, Cleveland 13, Ohio.

EXPERIENCED FORGING ENGINEER AVAILABLE. Expert in hand tools and railroad work, production, design and management. Willing to travel. Passport in order. Reply Box 146, STEEL, Penton Building, Cleveland 13, Ohio.

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Twenty-five years experience in manufacturing of sheet metal stampings, tool-die design and construction. Emphasis on high speed production, progressive and deep draws. Reply Box 175, STEEL, Penton Building, Cleveland 13, Ohio.

BOLT AND NUT SALES EXECUTIVE with an excellent acquaintance with the larger Distributor and Consumer buyers of Cap Screws, Bolts and Nuts, wishes to represent manufacturer on a commission basis in Kentucky, Illinois, Ohio and Indiana. Reply Box 176, STEEL, Penton Building, Cleveland 13, Ohio.

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5 to 11 GA. (.127 to .210 THICK)
H.R. or H.R.P.O. SHEETS
DROP-OFFS — WASTERS
SECONDS
UP TO 500 TONS
MONTHLY NEEDED
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PLANT SUPERINTENDENT

For small long-established Forging Plant in Akron, Ohio. Prefer man who has a good knowledge of Small Upsetters (2" sizes), Drop Hammers (3000 lbs), Maxi Presses, Punch Press, Tool and dies, etc. Plant manufactures nationally known line of Mechanic Hand Tools.

If you have proven supervisory and management ability in directing a working force of approximately 50 people, write stating full particulars, salary expected, etc.

Box 155, STEEL
Penton Building Cleveland 13, Ohio

CONTACT METALLURGIST
For Sheet Mill

Must have cold sheet experience, automotive preferred

Here's a splendid opportunity for an energetic man to start at a good salary with a progressive integrated steel maker. For personal interview tell us about yourself—your experience, age, marital status, salary desired. Write in confidence. Our own men have been informed regarding the placing of this advertisement. All replies will naturally be held strictly confidential. Address your applicaton to:

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Penton Building Cleveland 13, Ohio

ENGINEERS
STRUCTURAL STEEL SALES PROMOTION

To meet requirements of an expanded program several engineers are needed immediately for technical and promotional work with customers of the structural steel fabricating industry. These are permanent positions with a national trade and technical organization.

Positions are in field offices in central and midwestern states. Some travel required. Excellent opportunities for advancement and for showing initiative and judgment.

Applicants should have B.S. in Civil Engineering, preferably with a major in structural. Experience in design and construction in structural steel, and promotional contact with architects, engineers and contractors desirable.

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Send complete resume, recent photograph and salary requirements BY MAIL to:

AMERICAN INSTITUTE OF STEEL CONSTRUCTION, INC.
101 PARK AVENUE, NEW YORK 17, NEW YORK

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Beaver Falls . . . Penna.

Cross-Bay Transfer
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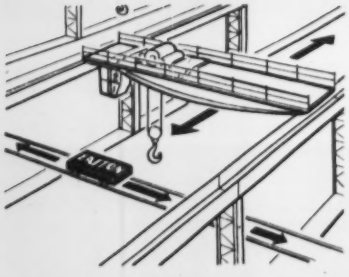

The EASTON motorized cross-bay transfer car is designed to provide lateral handling of materials to supplement overhead crane service in modern multiple bay plants. The cross-bay movement of the automatic transfer car provides a universal handling system able to spot a load anywhere on the floor of the plant. The same car system may also be used for moving materials between plant buildings.

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Sales Offices in New York
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AN EASTON 100-TON cross-bay transfer car showing general details of construction.

EASTON

A-1046

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Buy hand protection

Time out due to hand injuries costs industry more than any other plant accident. Skilled hands are your long suit. Protect them with Jomac® Work Gloves . . . durable, yet low in cost. Write today for our new catalog. Jomac Inc., Dept. E, Philadelphia 38, Pa.

Jomac Hand Guards, made of springy, tough Jomac Cloth, can be worn over gloves, if desired, to give maximum protection against sharp metal, blows or burns. They can be reconditioned repeatedly.

It pays to keep Jomacs on hand

JOMAC

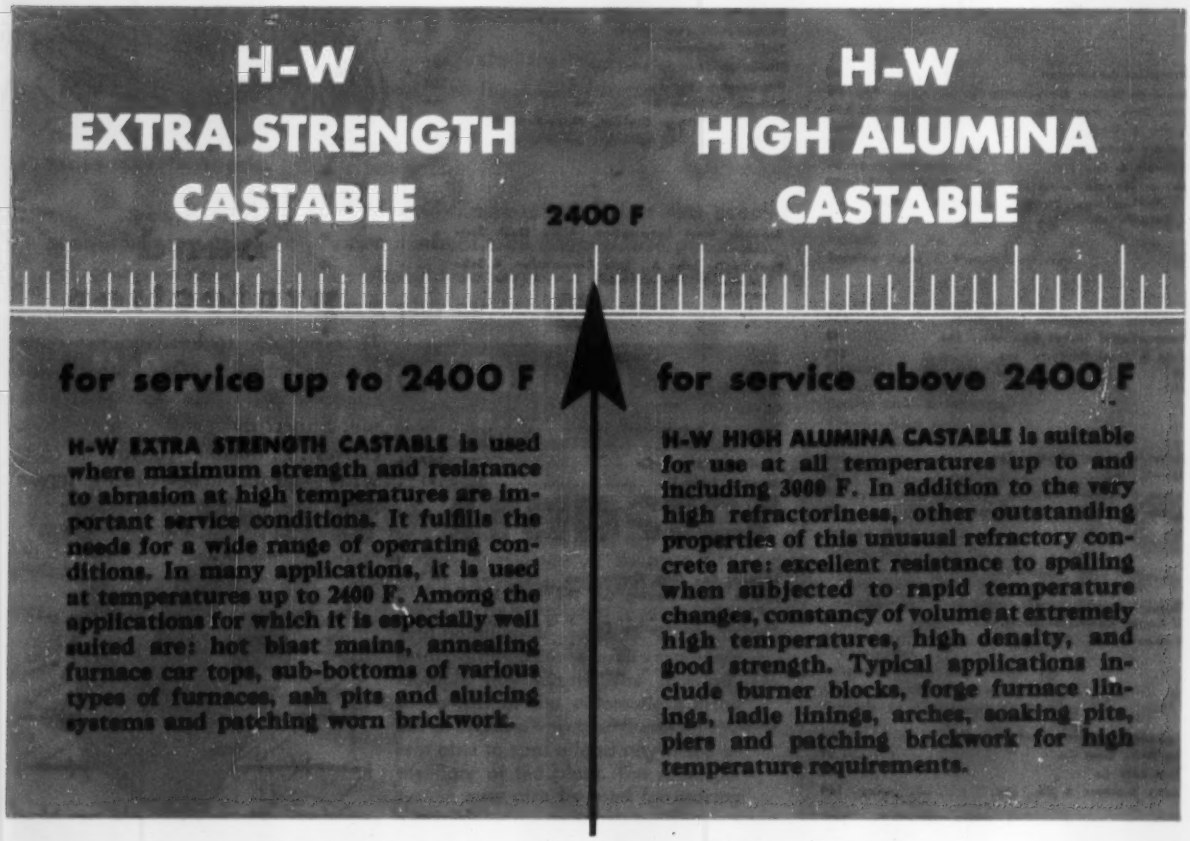
INDUSTRIAL WORK GLOVES

Outwear ordinary work gloves by 900%

Plants in Philadelphia, Pa., and Warsaw, Ind.

THESE TWO HARBISON-WALKER CASTABLE REFRACTORIES

to serve you better . . .
for a wide range of operating conditions



for service up to 2400 F

H-W EXTRA STRENGTH CASTABLE is used where maximum strength and resistance to abrasion at high temperatures are important service conditions. It fulfills the needs for a wide range of operating conditions. In many applications, it is used at temperatures up to 2400 F. Among the applications for which it is especially well suited are: hot blast mains, annealing furnace car tops, sub-bottoms of various types of furnaces, ash pits and sluicing systems and patching worn brickwork.

for service above 2400 F

H-W HIGH ALUMINA CASTABLE is suitable for use at all temperatures up to and including 3000 F. In addition to the very high refractoriness, other outstanding properties of this unusual refractory concrete are: excellent resistance to spalling when subjected to rapid temperature changes, constancy of volume at extremely high temperatures, high density, and good strength. Typical applications include burner blocks, forge furnace linings, ladle linings, arches, soaking pits, piers and patching brickwork for high temperature requirements.

These refractory castables can be mixed and poured like concrete or can be applied by means of various types of air guns.

Harbison-Walker castable refractories are available in all the various classes, having the most desirable combinations of properties for particular requirements, such as adequate refractoriness, strength, insulating value, resistance to thermal shock and the corrosive action of slags and fluxes.

Please write us for detailed information and recommendations for specific applications.

HARBISON-WALKER REFRACTORIES COMPANY
AND SUBSIDIARIES
WORLD'S LARGEST PRODUCER OF REFRACTORIES
General Offices . . . Pittsburgh 22, Penna.

Small automatic Farval system saves labor, time, lubricant in automobile engine production

FARVAL—
Studies in Centralized Lubrication
No. 160

LUBRICATION studies show it would take an oiler 18 minutes *each cycle* if he had to hand lubricate this block boring machine—with the machine shut down. But by installation of a small Farval automatic system, the lubrication job is done better in seconds—and *while the machine is operating.* Thus, Farval increases machine production time and eliminates the cost of a full-time oiler. In addition, Farval saves as much as 75% in lubricant used on the 24 points of this machine.

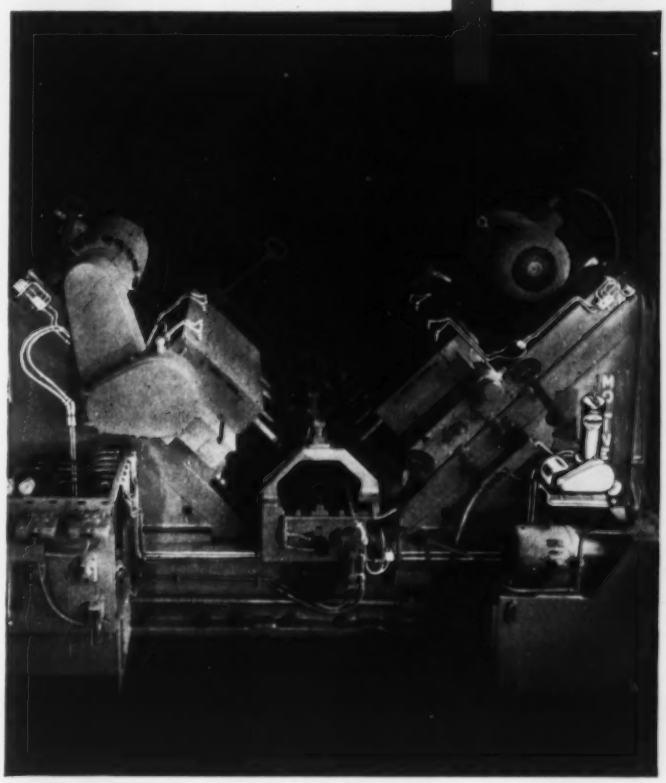
Farval is Foolproof

Farval manually operated and automatic systems deliver a measured amount of clean lubricant whenever needed to all bearings. The Farval Dualine valve placed at each bearing has only two moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. A tell-tale indicator at each bearing gives positive proof that every valve has received the lubricant it needs.

Free Lubrication Survey

Let us send one of our lubrication engineers to inspect your plant equipment. Without obligation, he will present a written analysis of what Farval can do for you. Write also for free Bulletin 26 for the complete Farval story. The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

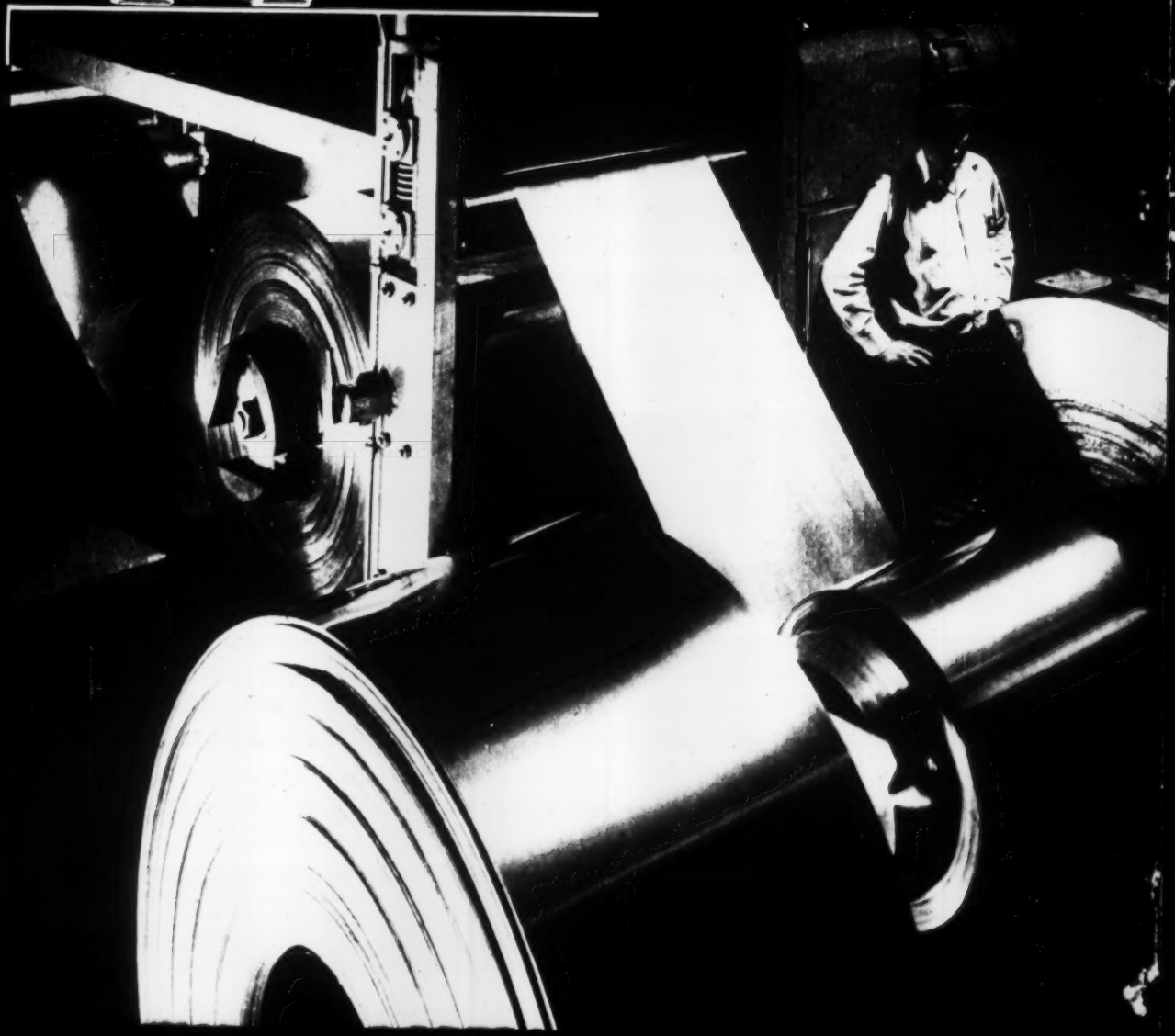
Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



It's only 20½" high! Yet the Farval DC 20 automatic pumping station you see in this photograph keeps this Moline boring machine properly lubricated at all times in this automobile engine plant.

KEYS TO ADEQUATE LUBRICATION—**Wherever you see the sign of Farval—the familiar central pumping station, dual lubricant lines and valve manifolds—you know a machine is being properly lubricated. Farval manually operated and automatic systems protect millions of industrial bearings.**

The MEAN Company, Inc.



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